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COMPUTERWORLD

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Wide World Photos

DP Stumps for Candidates

•In Carter Camp

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Since the day after Thanksgiving, Carter-Mondale Presidential Committee staff members have been directing machines to send out "tens of thousands" of letters urging Americans to support the incumbents in the White House.

The process is called "political persuasion," and in this day and age it can only be done effectively with computers and sophisticated high-speed printers that do everything but lick the stamps.

"Beyond any doubt, there is no other way to do what we are doing," according to Glenn Cowan, deputy director of voter contact for the committee. "The alternative would have been to make telephone calls and then give the list of 'favorable' and 'undecided' voters to a field organization. The field organization would have then had two choices: either to send letters that said 'Dear Friend' in (Continued on Page 4)

Bill Would Centralize Federal DP

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. — Legislation to create a centralized federal office to set governmentwide information policies and oversee federal agency information management activities has been introduced in the House of Representatives.

The Paperwork Reduction Act of 1980, introduced Feb. 5 by Rep. Jack Brooks (D-Texas), calls for a high-level (Continued on Page 8)

•For Kennedy Coffers

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Democratic Presidential challenger Sen. Edward Kennedy (D-Mass.), while still trailing President Jimmy Carter in popularity polls, is reportedly way ahead in contributions solicited by direct mail.

Carter's direct-mail staff indicated \$400,000 has been raised through word processing and direct-mail methods. In contrast, Kennedy's direct-mail efforts have netted about \$700,000 (Continued on Page 4)

Performance Analysis Tougher

Report: CICS 1.5 Has Trade-Offs

By Marcy Rosenberg
CW Staff

MARINA DEL REY, Calif. — Users are expected to embrace many of the enhancements IBM has promised in Release 1.5 of CICS/VS, but several of the added capabilities may make it harder to analyze the performance of the widely used data communications monitor.

And although this latest CICS/VS release — not due out until May for DOS users and September for OS users — boasts expanded monitoring facilities, these will provide only data collection routines and leave to the user the burden of writing data analysis programs for performance tuning.

Drawing these conclusions was Eric P. Emanuel, former chairman of IBM's Guide user group CICS Performance Committee, in a report issued by Candle Corp., a systems software firm for which Emanuel now does consulting work.

In Emanuel's view, the two enhancements that will most

affect the design and operation of systems running under CICS will be the addition in Release 1.5 of multiregion operation and the extension of the intersystem communications capability offered in the earlier Release 1.4.

Obsolescence of FDP

CICS/VS multiregion operation will obsolete Peer Address Spaces, an IBM Field-Developed Program (FDP) currently available to CICS/VS users. Among what Emanuel termed "serious drawbacks" to this FDP are that it lacks Vtam and Vsam support.

With multiregion operation, however, users can run within a system multiple copies of logically connected CICS regions that will share files, terminals, transactions and other system resources with complete transparency to the user.

In addition, an individual CICS region can be stopped, changed and restarted without interrupting the other CICS regions, Emanuel pointed out. Facilities within multiregion operation include transaction

'No Thanks' Say Users of 4331s To IBM's DBMS

By Tom Henkel
CW Staff

A survey of 25 DPers that have ordered or already installed IBM 4331 CPUs with the DOS/VSE operating system found that few of those users will use IBM's DL/1-DOS/CICS data base management system (DBMS).

Five of the surveyed users plan to use the DL/1-DOS/CICS combination. Four do not plan to use any DBMS at all; 16 either have chosen another DBMS vendor or are seriously thinking of doing so.

Poor performance and a lack of flexibility were the major reasons stated for disliking the DL/1-DOS/CICS combination. Some users pointed to more site-specific complaints; some noted IBM's DBMS lacks a report writer and others said DL/1 will not communicate with any non-IBM DBMS.

The most uncomplimentary reports came from a Salinas,

Calif.-based 4331 user who said he tried the IBM DBMS on his newly installed machine only to find it did not work. The user is also running IBM's VSE/Vsam.

The Salinas user said the IBM DBMS did not access files in the proper sequence and DL/1 did not interact with CICS or Vsam properly.

As a solution, the user switched to another vendor's DBMS, in this case Software AG's Adabas. The user also dropped Vsam, but kept CICS. The DBMS is now working up to par, he reported.

Leery of DL/1

Other users with installed 4331s — but yet-to-be installed DBMS — are leery of DL/1. They have heard of performance problems with the package, but could not go into more detail about what kinds of performance problems are allegedly occurring.

A first-time IBM user in a mainly Burroughs Corp. shop decided to take the IBM DBMS "because we wanted to stay under the big blue wing for a while." However, the firm's DP manager is having second thoughts about DL/1.

"We may not stick with DL/1. We had some people with DL/1 experience, so the firm decided to go with that," he explained.

"DL/1 is not flexible enough to do DBMS-to-DBMS talk- (Continued on Page 7)

February 1981 Targeted For Nine-Digit Zip Code

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. — The U.S. Postal Service has set February 1981 as the target date for implementing its nine-digit Zip Code scheme and hopes to have available at that time magnetic tapes for updating computer files to the new postal program.

The post office plans to complete its nationwide nine-digit coding effort and assemble a data base of the new codes early next year, according to Thomas Dewey of the Postal Service's Office of Zip Code

Expansion.

Dewey's office was established in January 1979 to conduct the coding operation and produce the data base. So far, he said, the scheme has proved successful in its first test, consisting of full coding of Wilmington, Del.

The nine-digit Zip Code, announced in September 1978 after a two-year study, consists of the existing five-digit codes plus four more numbers to designate individual street blocks, buildings and businesses within established (Continued on Page 8)



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Despite Outcry From Controllers FAA Proceeding With Arts IIIA

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — The Federal Aviation Administration's (FAA) Arts IIIA air traffic control system, a hybrid of which Tampa controllers have labeled "unsafe and unreliable" [CW, Feb. 11], will be installed in 28 airports around the country by next January.

While FAA spokesman said the Arts IIIA will be "completely different" from the troublesome Tampa system, controllers claim it still has a number of bugs to be worked out.

The system is already being phased into operation in Minneapolis, Santa Ana, Dallas-Ft. Worth, Atlanta, Houston and Boston; Chicago and Los Angeles are next on the list. Arts IIIA reportedly offers quick recovery from system interruptions, but controllers contend it still presents problems that could pose danger to air travelers.

"When in use, the Arts IIIA is good equipment," acknowledged Pat Doyle, vice-president for the Professional Air Traffic Controllers Organization's (Patco) Great Lakes Region. "However, when it fails — which it does at an alarming rate [at Minneapolis] — it's no good at all."

Patco Representative Michael Feron at Boston's Logan International Airport also reported the system fails "to often," for periods lasting "several seconds to several minutes."

System Enhancements

Arts IIIA offers such improvements over the currently used Arts III as completely digitized radar, refresh radar display, accessibility to more processor memory, a fail-soft capability and tracking of "primary" radar targets (aircraft without electronic transponders transmitting coded altitude,

speed and identification data).

Based on a Univac I/O P-B an enhancement of Arts III's Univac Input/Output Processor (I/O-P) the Arts IIIA's recovery rate from system interruptions has dropped from about 27 seconds to about four seconds, according to Mike Coe, Patco facility representative at Atlanta International Airport.

"As controllers, we put an awful lot of faith and trust in the computer," Coe said, "so it's very important to us that if it fails, it recovers very quickly."

Two Problems

One problem with the system, however, is that the computer's to sometimes fails to track an airplane or sometimes tracks an airplane that is not there; another is that overlapping targets are displayed on the radarscopes, Coe said. Such symptoms have also been reported at Minneapolis, Doyle said.

"The computer people say the fault lies with our secondary radar system equipment, and our secondary radar system people tend to believe it's the computer," Coe said. "The only thing the controller knows is that the damn thing doesn't do everything people say it'll do."

The problem of overlapping targets means controllers cannot distinguish among several targets displayed simultaneously. "Any time you have a lot of clutter in a major facility area like ours and the alphanumeric data blocks overlap, you can't distinguish them," Coe said. The data blocks indicate an aircraft's flight number, airline, ground speed and altitude.

While acknowledging the benefits of the Arts IIIA, Coe recalled that the original Arts I system — which was in-

stalled first at Atlanta — at least did not have a serious problem with overlapping targets. "I don't believe we had quite as much trouble with the Arts I because we could change the individual targets' leader direction," he noted.

"The Arts III is supposed to 'surge' and move a target away from any other targets, but it doesn't do it," he added. "The targets are constantly overlapping."

Tracking Problem

As for the problem of not tracking aircraft, often "when we cross-check with an adjacent facility or Air Route Traffic Control Center, we can't see an airplane but they can," Coe stressed that the problem could lie not only with the computer, but possibly also with the radar system or beacon system.

Wherever the trouble originates, "it's an extremely dangerous situation when we can't see an airplane that's there."

"When we're expecting the computer to track an airplane and it doesn't, and unless we happen to have our attention on that particular airplane at the time the computer quits tracking it, there's the possibility of our losing that target for a short or even a long period of time," Coe said. "Of course, that can create a very hazardous situation."

Correction

In "International Treaty on Data Protection, Privacy in Limbo" [CW, Jan. 28], a reference to the Council of Ministers was erroneously changed to the Council of Europe, changing the meaning of the story.

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Carter DP Keying on 'Political Persuasion'

(Continued from Page 1)

hand-addressed envelopes, or to attempt to handwrite small, personalized letters," Cowan said. "But the impact is much greater in these circumstances to send a personalized letter."

When Cowan says "personalized," he really means "mass-produced to look personalized" — the apparent key to success in winning political and monetary support for candidates in the modern age.

And with the upcoming New England primaries on Feb. 26 (New Hampshire) and March 4 (Massachusetts), Cowan and his colleagues are sending thousands of personalized letters per day to Democratic and Independent voters in those states.

What does such a letter say? "Basically, it is a letter just thanking the supporters for their support, encouraging their continued support, reminding them when election day is and encouraging them to vote," Cowan explained.

"For the undecideds, we attempt to show them some reasons why they should support the President by indicating some stands he's taken on particular issues or some accomplishments specific to the particular state," he continued.

Using the local Automated Datatron, Inc.'s (ADI) Xerox Corp. 9700 laser printer, "we personalize all of them," produced at the rate of two per second, Cowan said. Although the system is capable of citing specific responses voters have given in telephone interviews, to date the letters have not done that.

Future Use

As for the future use of the capability, "it depends on the particular state and whether or not we feel there are more than two or three issues that are likely to be of great importance," Cowan said.

"If there are only two or three, we would include them in every letter, but if we felt there was such a gamut of is-

suces that we had to specify, we have the capability of inserting variable-issues paragraphs in each letter, as processed by the 9700."

Renting no mailing lists from brokers as Carter's direct mail fund-raising effort does, the staff instead gets names, addresses and phone numbers from two sources: voter registration tapes and the phone books — "all very public information," Cowan noted.

The direct mail process begins by determining which names on the voter registration lists are eligible to participate in a particular situation, such as a primary or Democratic Party caucus, and narrowing the lists to include only those names, Cowan explained.

"We then target specific populations that are more likely than others to support the president, because we cannot afford to call everyone in a state," he said.

Likely Support

In determining who is most likely to support Carter, the mailers use polling data, demographic information and results from previous elections. "We will look at some previous statewide elec-

tion that had similar candidates to those we're dealing with now," he explained. Finally, after telephone interviews, they send the personalized letters to committed supporters and "undecideds."

For its computing and word processing power, the committee contracts principally with three outside firms: Computer Network Corp. (Comnet), Action Data Processing, Inc. and ADI, all in the D.C. area.

ADI is principally a letter-production firm that does some software work and data manipulation functions, Cowan said. Comnet uses an IBM 370/158 and an Ite Corp. A56, which simulates IBM equipment, to receive data from the field. Comnet then supplies that data on magnetic tape to ADI for letter production.

Comnet receives name and address information from "dozens" of Texas Instruments, Inc. 765 terminals located at phone banks that are busy targeting likely supporters of Carter. Cowan would not specify the exact number because "that could be valuable information for someone."

Comnet can receive the data from all

the 40K-byte memory terminals at the rate of 10,000 names a day and is working to increase the capability within a month to 30,000 a day.

Comnet then translates the data into Xerox 9700 language on magnetic tapes for future letter production, Cowan explained. Along with names and addresses are letter codes that tell the 9700 which letter form to send the individual in question.

"Once we've generated some letters, we might want to go back for a second run to pull political subdivision-specified files to then produce a 9700 driver tape, for which we use Action Data," he added.

For example, Action Data can separate from the lists certain supporters who live within a given precinct, who are of "a particular type of persuadability" or who expressed an interest in a specific issue, Cowan explained. Action Data uses an IBM 360/30.

Such capabilities are a far cry from such "old-fashioned" methods as handwritten letters, computer-generated line-printed letters, facsimile telegrams and limited-volume word processing systems, he concluded.

Kennedy Nets \$700,000 by Direct Mail

(Continued from Page 1)

through similar but less sophisticated methods, according to a spokeswoman for Morris Dees, Kennedy's finance chairman.

In overall contributions, from such sources as fund-raising dinners, however, Carter leads Kennedy with \$6.7 million, almost double Kennedy's \$3.4 million.

In charge of Kennedy's direct-mail fund-raising effort is the direct-mail consulting and management firm of Craver, Matthews & Smith Co., a company that said it ideologically stands behind all of its clients, be they political or otherwise.

The firm deals mainly with such citizens' groups as the American Civil Li-

berties Union, Sierra Club, National Organization for Women, Common Cause, Hand Gun Control, National Abortion Rights League and Planned Parenthood — and has about 50 clients, noted Tom Matthews, a partner in the firm.

In the political realm, the firm lists as clients Sen. Birch Bayh (D-Ind.), Sen. John Culver (D-Iowa), Sen. Robert Packwood (R-Ore.) and Rep. Elizabeth Holtzman (D-N.Y.). Most, but not all, of the political clients are Democratic, and all are "on the left side of the aisle," Matthews said.

Kennedy Finance Chairman Dees handled Carter's fund-raising in 1976, but only because Kennedy did not run that year. For political reasons Dees

did not contract with Craver, Matthews & Smith Co. at that time.

Matthews recalled "We opposed ter then; we ran the direct mail for [Rep.] Morris Udall [D-Ariz.]."

Since starting the direct-mail campaign for Kennedy last November, Craver, Matthews & Smith has rented about 60 mailing lists from brokers. These lists include the names of subscribers to publications and contributors to various causes who would be likely to support Kennedy, Matthews explained.

A Million Letters

The only information furnished on the lists are name, address and the publication subscribed to or the organization to which the person belongs, he said, adding that the 60 lists from which mailings have been done so far have contained "a little over a million" names.

Each letter sent out is a one-shot attempt to raise funds, according to Matthews, and there are no follow-up or word-processed "personalized" letters citing previous contributions. The only way someone might receive more than one letter would be if a name appeared on more than one list.

The standard letter, which opens "Dear Friend," is "very simple and very straightforward," Matthews said. The strategy used within is "self-evident."

While Matthews could not specify the computer firms with which the company contracts for direct-mail tasks, Compac, Inc. — which maintains Carter's contributor files — also maintains some names, financial information and Federal Election Commission reporting data for the Kennedy campaign, Compac President Jim Burton said.

Compac's equipment includes an IBM 360/50 with 512K bytes of memory, two IBM 1403 printers operating at 1,100 line/min and 2.5M bytes of disk storage.



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QWIKTERM

To Track People and Money Carter Camp Mixing In-House, Outside DP

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Tying together and overseeing the DP functions of the Carter-Mondale Presidential Committee — fund-raising, political persuasion and otherwise — is Bill Krause, its director of information systems.

Krause, in his eighth year as a DP professional, came to his present job through the Georgia state government, where he helped develop that state's National Crime Information Center system as well as an automated court system.

While the Carter-Mondale Committee does use "approximately seven" outside DP firms for some of its needs, such as mass mailings and maintenance of Federal Election Commission data for report generation, Krause would not specify which firms. He did, however, describe his in-house installation — to an extent.

Two stand-alone Tektronix, Inc. processors with built-in disk drives and attached printers do "a good 70%" of the group's work in-house. "When it comes to mass stuff — like hundreds of thousands of letters going out — we use the outside firms," he explained.

Krause was reluctant to discuss the model numbers of his processors, and described himself as "kind of sensitive about exactly what we're using." The system "would be a lot easier to get into if [an intruder] knows what it is."

Also declining to identify his Tektronix printers with model numbers or speeds, Krause simply described them as "slow — we don't do anything that takes huge, massive processing because we have more time and manpower than we have money or a need for instant results."

Finding the Right Person

One major function of these machines is to keep track of various people and lots of money, Krause explained. His "favorite" application is a scheduling system that puts a finger on presidential "surrogates," administrative people and campaign workers who are constantly moving around the country in this politically active year.

The application, which according to Krause is working very smoothly, can sort pertinent information about a person's whereabouts by state, date or type of event. Mixed into the scheduling are names of members of a newly formed Committee of Athletes and Artists for Carter who will soon be stumping for the President.

"If we need somebody at a certain place, we can run a report to see, for example, who will be in Illinois on March 14 who could do an event for us or show up to give some support," Krause noted.

In addition to tracking Washington-based people as they move around the country, the system also functions at a state level. "We identify different key people for each state, so if we need to send somebody there we will know with whom we need to touch base according to protocol," he explained.

Other Applications

Another application Krause discussed is delegate selections. At the upcoming Democratic Convention, in-

house computing power will be joined by a time-sharing system using CRT terminals on the convention floor. The group hopes to do some on-the-spot modeling and projections "to keep up with the events minute-by-minute as people change and go one way or another," he said. "Then we'll know where to target [our efforts] next."

Krause's system also maintains a full record of volunteers working for Carter, listed according to their talents and when they might be available. That list could be used, he said, to find someone "who types and who can work on Saturday afternoon," for instance.

The committee's press data (also maintained here) is "nothing but a la-

bel program" Krause said — an up-to-date mailing list for sending out press releases. The list can be sorted by geographical area or nationality (for example, Hispanic newspapers) or by a selected type of media, like broadcasting.

Coordinating With Outside Firms

Most of the Federal Election Commission financial reporting is done outside, Krause noted, but there is some expenditure-tracking going on in-house "so we can have some idea of when we're getting close to spending too much money, of who's been issued bank drafts and of which [drafts] have come back and which ones haven't."

In direct-mail campaigns, all pertinent data is kept in the system and can then be sent on tape to contractors for certain jobs. Alternatively, the DP director may authorize contractors to use data they have stored at their sites.

Presently, phone bank workers use Tektronix CRT terminals, each with 32K bytes of memory, to enter information gleaned from voters in telephone interviews. The data is stored on tape, which is then processed in-house and sorted.

"It's not superslick and fast, but it gives us control over everything ourselves so we're not dependent on outside sources for sensitive information," Krause said.

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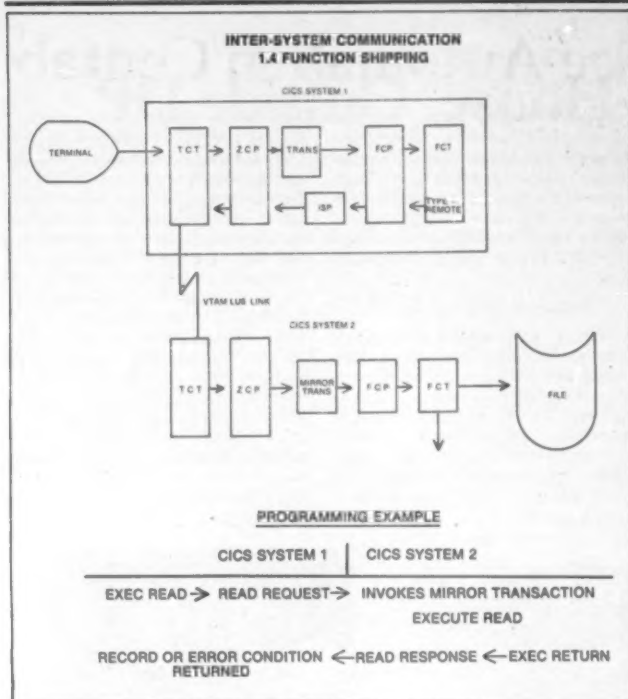


Figure 1

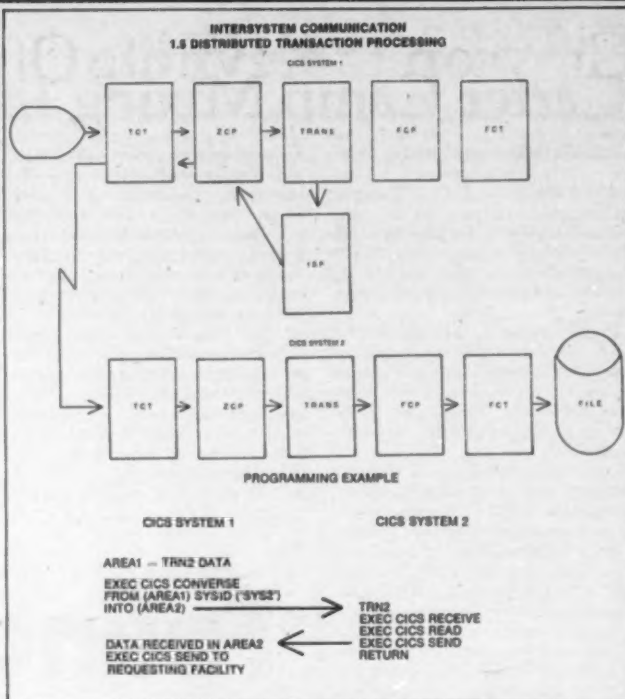


Figure 2

Report Pinpoints CICS 1.4, 1.5 Trade-Offs

(Continued from Page 1)

to Emanuel.

For example, users running multiple CICS systems independently will be able to use one as a test system and another as a production system. For departmental separation, one system can run a payroll information application while a second can run order entry.

The function shipping facility allows

users from one CICS region to access data in another region, Emanuel explained. He added that file control table entries can limit multiregion accessing — for example, by setting up a transaction running in one CICS system to retrieve but not update data on a file in a second CICS system.

With transaction routing, a user in one region can invoke a transaction to execute in another region to balance and optimize CICS system resources across CICS/VS regions. As an example, Emanuel noted that a terminal normally attached to one CICS system can start a task in a different system, detach before the task is complete and so place transaction control with the second system.

Intersystem Communications

Turning to intersystem communications, Emanuel said Release 1.5 adds a distributed transaction processing capability that partially improves on the use of function shipping in Release 1.4 for handling direct communications between CICS/VS transactions.

However, while distributed transaction processing offers several advantages over function shipping, Emanuel noted the trade-off lies in the degree of user involvement required for each.

Function shipping (see Figure 1) requires no specialized user programming for most applications, he said, but is limited in that control of the task stays in the originating system. As a result, the originating task must be active throughout the life of the transaction in the remote system, since all error recovery is done in the originating system.

With distributed transaction processing (see Figure 2), users reportedly can write an application as two complementary transactions, one executing in the same system as the originating terminal and the other executing in a remote system. This balances the application load between systems in an in-

tersystem communications network, Emanuel observed.

Data transfer also is more efficient than through function shipping, where one message is transmitted over the Vtm link from system to system for each data record. Because the Vtm link is heavily used, bottlenecks, especially in file-browse situations, can occur, he explained.

By comparison, distributed transaction processing permits each message to include several data records. And since error handling can be performed in the remote system, the Vtm link between systems is freed for other applications.

Here's the Rub

The rub, though, is that distributed transaction processing requires special complementary programming commands, while function shipping can be used in Release 1.5 with little modification to existing applications in 1.4. Hence, distributed transaction processing calls for more user involvement.

With that facility, existing programs need heavy modifications because of the interactions required between transactions on different systems. Comparing figures 1 and 2 points up some of the differences between distributed transaction processing and function shipping.

Figure 1 shows a read request through 1.4 function shipping. The request goes through the terminal control table (TCT) to the terminal control program (ZCP) to initiate a transaction that then issues a file control request.

The file control program interrogates the file control table, discovers the request is a TYPE-REMOTE and routes the request to the other system via the Intersystem Communications Program (ISP).

The Figure 1 programming example shows the application program in CICS System 1 executes a READ

which, through file control table specifications, invokes the mirror transaction (READ) in CICS System 2. The information then passes back through an EXEC RETURN command, CICS System 1 reads the response and handles either the data or an error condition.

In Figure 2, a file request through CICS 1.5 distributed transaction processing also goes through TCT and ZCP to invoke the user application program, but here the user must specify whether a remote transaction is to be invoked. Control is then passed back to ZCP with the appropriate transaction in CICS System 2 running independently of System 1.

Emanuel stressed that it is the user — not system programming parameters — that determines whether the intersystem communications facility should be used with CICS 1.5 distributed transaction processing.

Good News, Bad News

The good news is that CICS 1.5 will support the ACF/Vtm Release 2 parallel sessions facility, which allows CICS users to run a number of concurrent sessions through the Vtm link between systems.

The bad news is that concurrent sessions reduce automatic recovery capabilities, Emanuel explained. This means that if a message is not received through the ACF/Vtm parallel sessions facility, the whole message must be sent again, leaving the application program to check for errors.

IBM is reportedly working on automatic recovery support in this area, but whether the problem will be remedied by the time CICS 1.5 is released to the general public is unknown.

"The CICS 1.5 Report," which examines other aspects of the release, costs \$5 from Candle Corp., Suite 401, 4676 Admiralty Way, Marina del Rey, Calif. 90291.

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Grayson to Keynote Office Automation Confab

ATLANTA — If the U.S. expects to increase its industrial productivity, its managers are going to have to board the technology bandwagon.

In fact, managers are in greater need of improvement than blue-collar workers when it comes to productivity, according to Dr. C. Jackson Grayson, keynote speaker for the first annual Office Automation Conference. The conference is slated for March 3-5 at the Georgia World Congress Center and is being sponsored by the American Federation of Information Processing Societies (Afips).

Users Say 'No' To IBM DBMS

(Continued from Page 1)

ing with the Burroughs system," he added and went on to say DL/1 "lacks sophistication." He has not yet looked at other vendors' offerings, however, and does not know if there is another available package that could provide the DBMS-to-DBMS "talking" for which he is searching.

Another user with a 4331 has yet to install a DBMS, but said IBM's offering probably won't be his choice. That user mentioned as likely candidates Adabas along with Cincom Systems, Inc.'s Total and Mathmatica, Inc.'s Ramis II.

Currently running Dbomp, the user said he would choose DL/1 over other vendors' packages only if IBM is the only vendor offering a bridge program linking Dbomp with the DBMS. Switching to another vendor's package may be a rough conversion, the user said.

No Decision Yet

A recent *Computerworld* survey of 15 4300 users planning on running DOS/VSE showed three plan to use the DL/1 DBMS [CW, Feb. 11]. Users in that survey said they favor other vendor's DBMS packages, but the 15 polled did not offer a clear consensus of a favorite vendor.

Since the 4300 series is just starting to make its appearance at end-user sites — a reasonably large base of 4331s is installed but relatively few 4341s have been delivered — most 4331 users contacted by *Computerworld* for its survey have not gotten around to addressing the issue of a DBMS. Most said they are still trying to make the conversion from DOS/VSE to DOS/VSE, a conversion many characterized as a laborious but not a devastating process.

Asked if DL/1 is in their plans, those users told of rumored performance problems on the package, but none could specify what those problems were. Most, however, said they plan to look at other vendors' packages before making a DBMS decision.

One user, although not thrilled with IBM's offering, said he is more wary of other vendors' packages. Planning to install DL/1 on a 4331 in the second quarter, the DP manager of that Minneapolis-based firm said, "Other vendors may be good, but I don't think we can get support here from other vendors. With IBM, if our systems engineer is not available there's always someone else." The user said he had not heard of problems with DL/1.

Grayson, an economist and former dean of the Business School at Southern Methodist University, will address the conference on opportunities for productivity growth through office automation technology. He now leads the American Productivity Center in Houston.

Grayson said the professional and managerial sector of the economy spends nearly 70% of its time seeking or giving information. "The future will see the need to integrate office automation technology for more productive ways to seek and use this information," he suggested.

"In the past, many managers have thought that they were exempt from technology, assigning its acceptance to production, secretarial staff and data

processing," he observed.

Grayson will speak at what organizers call "the first educational forum for the exposition of concepts and technology that constitute the office of the coming decades." The conference will cover basic precepts of office automation, explore current and future technology and set the stage for future development of the industry, organizers said.

It also features a series of luncheon workshops which will propose practical solutions to office problems in such areas as insurance, engineering, banking and law. This augments a conference schedule of more than 50 seminars, tutorials, panels and special events with a "how-to" approach to office automation, according to plan-

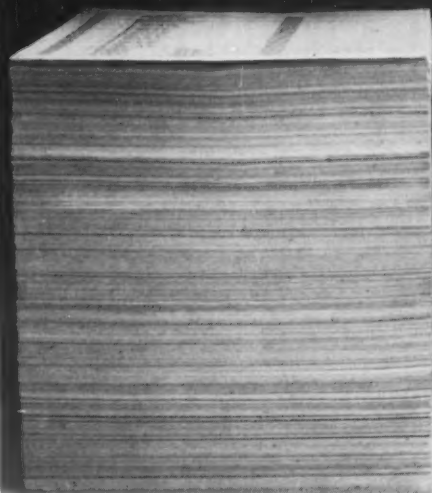
ners.

Speakers will cover topics such as insurance, banking, engineering and library information systems; using an office process language; measuring productivity; doing an office systems feasibility study; and time management and standards.

The luncheon costs \$8. Organizers also released a list of costs for other parts of the conference: full conference and proceedings digest, \$75; student attendance without digest, \$10; exhibits for three days, \$30; one-day exhibits, \$10; and one-day program and exhibits, \$30.

More information may be obtained from Afips at 1815 No. Lynn St., Arlington, Va. 22209.

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Nine Digits No Problem: Software Vendors

By Jay Woodruff
CW Staff

Moving from a five-digit to a nine-digit Zip Code should not present users with any serious difficulties, even though it could mean a time-consuming job for some, five software vendors contacted by *Computerworld* indicated last week.

"Unless people have set up their systems so it is hard to modify fields [containing the five-digit code], it does not appear that they will have a difficult time of it," an IBM spokesman said.

Another software vendor agreed the switch to nine digits is "no big deal," but said it does mean a very time-consuming conversion for large firms.

"You have to change the master file programs' field size, and every report has to be redefined. That wouldn't be a big thing if you didn't have a lot of programs, but some firms have hundreds," John Robinson, senior vice-president of payroll marketing for General Computer Services, Inc. of Huntsville, Ala., pointed out.

The larger code presents no problem for Cyborg Systems, Inc.'s software. "We use a 25-position field for city and state and a five-position field for the Zip Code. By trimming the city and state to a maximum of 21 positions, we have four positions left over in the field for the four additional Zip Code digits," a spokesman explained.

However, users of software with the city and state in separate fields would not be able to make the change as easily, he added.

A Walnut Creek, Calif., software vendor has already converted its software's major files to accommodate the nine-digit code, but has not done any "detailed work" on how to make the change in software already in the field. Generally, according to Kathy Urbelis, head of product development, Integral Systems, Inc. expects to author a one-time conversion that will run against existing table-driven files.

"We'll have to convert current records to expand to a nine-digit field,

then change the data table to tell it that the field is now nine digits," Urbelis said.

A spokesman for Management Science America, Inc. (MSA) said his firm uses a lot of standardized software. A user can address one area of a program and reach all other areas that are set up

under the same standards, reducing the time it takes to access Zip Code fields which appear through many programs.

"It will require work, but it won't be difficult to make the change," the spokesman concluded.

Although MSA "was not happy" to

hear of the change to nine digits, it appreciated learning well in advance that it was coming. "We found out about it in mid-1978, so we had the time we needed to prepare for its introduction in 1981. Some laws go into effect four days after we hear about them," the spokesman said.

February 1981 Set for Larger Zip Codes

(Continued from Page 1)

postal zones [CW, Oct. 2, 1978].

The Postal Service hopes the new codes will enhance opportunities for automating mail sorting and estimates that, with the new codes, seven employees will be able to do the sorting work now requiring 20 persons.

Dewey said several types of optical character recognition (OCR) equipment are being tested, including machinery made by ITT and Bell, Toshiba and AEG Telefunken, Inc. The OCR readers, similar to equipment already in use in Canada and Great Britain, will read the new Zip Codes and apply a bar code to the lower right-hand corner of each incoming envelope. The mail will then be sorted at local post offices by a bar reader.

DPers' Reactions

While the Postal Service looks for increased productivity, lower mail sorting costs and an opportunity to hold down rising postal rates, the nine-digit Zip Code has caused something of a stir in the DP community.

DP installations face a number of bothersome and time-consuming changes in implementing the new program, including wholesale expansion of data files, rewriting of numerous programs, revamping job control procedures, restructuring data entry and printing formats and obtaining new coding forms.

The Postal Service is not unsympathetic to these problems. "Ob-

viously we're aware of the magnitude of what's involved for a customer," Dewey said. Some people, he continued, "are going to look on it as a very expensive proposition, and maybe they're not going to be too interested in updating their files just on the basis that in the long run it's going to hold down postal costs."

Compliance Not Mandatory

If it is any consolation to DP managers who are pulling their hair at the prospect of hundreds of hours of file conversions, the Postal Service notes that the nine-digit Zip Codes are not mandatory, and the service does not expect rapid, across-the-board compliance with the new scheme.

According to Ronald Vandegrift, general manager of the Sales Division of the Postal Service's Customer Service Department, the Post Office

hopes to have approximately 80% compliance by 1985. Presently 97% of all mail posted carries a five-digit Zip Code.

As successful as the five-digit scheme has been, it took a long time to catch on, Vandegrift noted. But "when it was introduced in 1963, we weren't in the technology state that we are now. We would expect to be able to move faster [with the nine-digit program] given large systems conversions."

Once the national data base of new Zip Codes is completed, the Postal Service will assist in those systems conversions by making magnetic tapes available for major customers. "We haven't created the mechanism or even finalized the format yet of what these tapes will be," Dewey said, but predicted that 800-, 1,600- and 6,250 bit/in. nine-track tapes would be produced.

Bill Would Centralize DP

(Continued from Page 1)

Office of Federal Information Policy in the Office of Management and Budget (OMB) that would have responsibility for all government information practices.

In addition, each federal agency would designate a "senior official," reporting directly to the agency head, who would "systematically inventory its major information systems and periodically review its information management activities" as well as monitor agency compliance with the directives of the new OMB information policy office.

In opening hearings on the bill Feb. 7 before his Subcommittee on Legislation and National Security, Brooks said "this legislation is the result of a growing concern by the Congress and the President that something must be done to improve the way the government collects, uses and disseminates information."

Envisioned Functions

As envisioned in the legislation, H.R. 6410, the new OMB office would, among other things, set policies, standards and guidelines for DP and telecommunications functions and activities; work with the General Services Administration (GSA) to advise agencies on the acquisition and use of DP and telecommunications equipment and services; review agency activities in those areas; and promote automation "to improve the effectiveness of the use and dissemination of data in the operation of federal programs."

The bill, which embraces recommendations of the Commission on Federal Paperwork and the President's Federal Data Processing Reorganization Project, also directs the proposed office to:

- Develop a program to enforce federal information processing stan-

dards, particularly language standards, at all federal installations and revitalize the standards development program, separating it from peripheral technical assistance functions and directing it to the most productive areas."

- Develop uniform information policies and practices to reduce the paperwork burden imposed on the public by federal laws and regulations.

- Increase the availability and accuracy of federal information, while reducing duplication of agency reporting requirements.

- Promote greater agency information sharing.

- Oversee federal agency compliance with the Privacy Act of 1974 in the collection, maintenance, use and dissemination of personal information.

OMB has already moved to consolidate many of these activities in one office [CW, Jan. 29], but U.S. Comptroller General Elmer B. Staats told the Brooks Subcommittee that while the OMB move is "a positive step, we do not believe... it negates in any way the need for this legislation."

Without the legislation, "fragmented policy and oversight responsibilities will continue and badly needed changes in federal information management controls will not be effected."

Consolidating those responsibilities, as called for in the bill, and the projected funding of \$8 million for the first year of the new office's existence "will greatly strengthen the hand of OMB," he said.

Relating the legislation to the recommendations of the President's DP reorganization project, Philip J. Kiviat, who headed one of the project's task forces, told the subcommittee that "the bill takes the critically important step of explicitly assigning tasks and deadlines to the Office of Information Policy and to the agencies."

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Postal Service's Role Debated Ecom Issues Get Muddier in House Hearings

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — The debate over the U.S. Postal Service's proposed Electronic Computer-Originated Mail (Ecom) service became mired in a semantic swamp last week as two hearings before a House of Representatives subcommittee attempted to make the issue crystal clear.

"We did not foreclose the possibility of an electronic transmission system controlled by the Postal Service at some future time, assuming the Postal Service obtains the necessary regulatory approvals," Postal Rate Commission Chairman A. Lee Fritschler told the Subcommittee on Postal Personnel and Modernization on Feb. 6. He was referring to a recommendation concerning Ecom that the commission issued last December [CW, Dec. 24].

A week after Fritschler's appearance, commission member James H. Duffy told the same subcommittee that the December recommendation "forbids the Postal Service from offering electronic mail service to the public and excludes the Postal Service from contracting for or participating in the electronic transmission of mail."

Mass Mailers' Service

Ecom is designed for credit card companies, department stores, public utilities and other firms which must mail large quantities of customer statements and similar money-related documents on a regular basis. The messages would be transmitted on-line from each sender's site to serving post offices (SPO) in the nation's 25 largest cities. At an SPO, each message would be converted to hard copy and placed in an envelope; within two days after arriving at the SPO, the message would be delivered by a mail carrier.

In 1978, the Postal Service signed an exclusive contract with Western Union Telegraph Co. to transmit Ecom messages to each SPO from the telegraph company's Middletown, Va., Infomaster switching center (Ecom customers would employ dial-up or leased lines, at their own expense, to connect their sites with Middletown. Last December, however, the contract was terminated, for by then it had become apparent that the original Ecom plan was unlikely to be implemented.

One obstacle was the Federal Communications Commission (FCC), which earlier had told the Postal Service it would have to become a common carrier if it wanted to offer a "bundled" Ecom service — one that encompassed on-line message transmission. Vendors of electronic message services (EMS), meanwhile, launched a major attack on Ecom at the Postal Rate Commission — an advisory body to the Postal Service governors which, by law, must consider all new postal rate and mail classification proposals (Ecom is one of the latter). Postal Rate Commission recommendations are not binding on the Postal Service, but they generally carry considerable weight.

Last Dec. 17, the Postal Rate Commission decided by a 3-2 vote that the post office should confine itself to converting Ecom messages into hard-copy form at the SPOs and then delivering these letters; transmission, said the commission, should be per-

formed independently by common carriers, at least until the Postal Service can work out an accommodation with the FCC.

This is the decision the Postal Service governors are now considering. They may decide what to do this week, although the matter has come up at the last two meetings without being resolved.

Significant Comment

Since last December, the governors have been bombarded with advice from a number of sources — including the Carter Administration, the Computer & Communications Industry Association and the National Association

of Letter Carriers, among others. The recent hearing conducted by the House Subcommittee on Postal Personnel and Modernization was a continuation of this lobbying process.

Possibly the most significant comment made during the hearings came from Postal Rate Commission member James H. Duffy, who cast one of the two negative votes last December. "It is absurd to create a system, as the majority has proposed, over which neither the Postal Service nor anyone else has control and which can be abandoned at will by the common carriers," Duffy said. A contractual relationship for message transmission is vital to ensure that the service will come into ex-

istence; that it will continue to exist; that someone has responsibility for it; that service standards will be met; that nationwide service will be provided; and that the sanctity and privacy of the mail will be ensured from the time of transmission until delivery to the recipient."

Duffy added that "the data processing equipment [at the SPO] could sit and rust if the common carriers find it more advantageous to transmit messages to their own receiving terminals."

The majority decision said very little about where the buck will stop if its proposal for an unbundled Ecom service is implemented and messages fail to get through as quickly as promised.

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PAT5204 TAPE2 281 987654 1887 FT 4 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1887 FT 8 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1888 FT 13 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1889 FT 17 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1890 FT 21 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1891 FT 25 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1892 FT 30 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1893 FT 34 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1894 FT 39 IN 10 PERM DATA CHECK

PAT5204 TAPE2 281 987654 1895 FT 43 IN 10 PERM DATA CHECK

The length of these bad spots would cause unrecoverable data checks and I/O errors during processing.

INNOVATION DATA PROCESSING DATE 78-194

PAGE 0001

FAST ANALYSIS OF TAPE SURFACES DETAIL REPORT -- FATS VER 4.0 Z

MESSAGE ID UCB LABEL OPTION PASS FILE NO RECORDS LOCATION LENGTH RETRIES ACTION

PAT5107 TAPE1 280 123456 1 FT 1 FT 01 LABEL WRITTEN

PAT5204 TAPE1 280 123456 1 FT 1 FT 01 TEMP DATA CHECK

PAT5204 TAPE1 280 123456 1 FT 1 FT 02 TEMP DATA CHECK

PAT5204 TAPE1 280 123456 1 FT 1 FT 02 TEMP DATA CHECK

PAT5204 TAPE1 280 123456 2375 FT 4 IN 10 PERM DATA CHECK

PAT5204 TAPE1 280 123456 2375 FT 8 IN 10 PERM DATA CHECK

PAT5204 TAPE1 280 123456 2376 FT 13 IN 10 PERM DATA CHECK

PAT5204 TAPE1 280 123456 2377 FT 13 IN 10 PERM DATA CHECK

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Collapsed System Suspends City Utility Billing

By Jeffrey Beeler

CW West Coast Bureau

MOUNTAIN VIEW, Calif. — The collapse of this city's 15-year-old computing system has forced its user to suspend its utility-billing operations for the last four months.

During that time, the total value of the city's unprocessed—and therefore uncollected—utility bills has grown to an estimated \$110,000, according to municipal DP manager Virgil Adair.

The last gasp for the community's long-time billing system, built around an NCR Corp. Model 500 processor, came last October after months of sputtering and faltering.

Members of the municipal DP staff here had long foreseen the system's demise and had sought to avoid an in-

terruption of computing services by converting their billing programs from the NCR 500 to a more modern configuration build around a 1M-byte Hewlett-Packard Co. Model 3000.

But the old hardware broke down sooner than they had expected and, because of staff shortages and unexpected personnel turnover, the city's DP department overshot its August 1979 deadline for completing the billing-system conversion. In fact, as of Feb. 4, the conversion was still at least several days from completion, Adair said.

Billing Holiday

So between last October and the first week of February, the 60,000 or so residents of this Silicon Valley commu-

nity have received their municipal utilities free of charge, all because the city has had no method of computing and printing their bills.

But all signs suggest the city's billing holiday is about to end. With luck, the last of the community's billing programs will have been converted from the NCR 500 to the HP 3000 by about mid-February. At that point, Adair said, the city's billing operations will resume, and local residents will begin receiving their overdue bills—all in one lump sum.

Adair expects the community will have eliminated its entire backlog of unpaid utility bills within about two months after its program conversion is completed.

The reason for the billing-system

conversion can be traced to the city's dissatisfaction with its old NCR 500. "We had had the system since 1968, and it was simply beginning to wear out," Adair recalled.

Of particular concern to the city was the inefficiency of the old system's input/output unit, which used ledger cards for reading and writing raw account data like customer name and address, date of last billing, last amount paid and previous meter reading.

"When we updated a ledger card during a billing and later tried to read the data we had just written, we found we couldn't do it," Adair said. "So we'd have to start over again and go through the tedious process of rebuilding the data on that card."

As the performance of the ledger-card read/write unit steadily deteriorated, members of the municipal DP staff found they were having to spend more of their time rewriting unreadable data than doing the city's utility billing.

Eventually, the burden of wasted effort began to take its toll, and by last August the city had already fallen three months behind in its billing schedule, Adair said. Two months later, the backlog had become so serious the municipal DP staff decided to halt its billing operations temporarily so it could devote full time to systems development.

When the conversion to the new HP 3000 system is complete, the city plans to scrap its old NCR 500, Adair said.

Plato Improves Reading Skills

SAN ANTONIO, Texas — Johnny may not be able to read, but he sure can use a computer. Teachers here at the Knox Elementary School are hoping students' rapport with computers will teach them sorely needed skills.

Using Control Data Corp.'s Plato computer-assisted instruction program, Knox Elementary teachers have been improving students' reading levels in remedial classes.

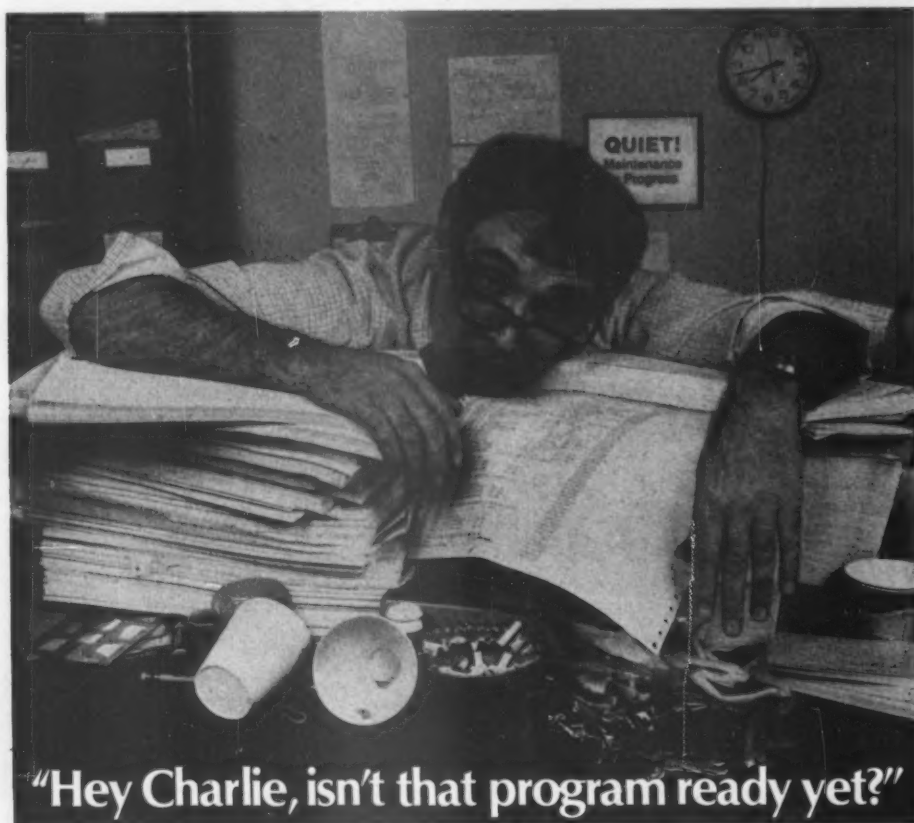
"We are teaching remedial reading to 64 children in the fourth and fifth grades under a federally funded program for underachievers," school principal Sylvia Santos said.

Four Plato terminals were installed last January as a supplementary program for remedial reading. Not all Knox's 120 students use the program. The 64 students using the terminals come mainly from Spanish-speaking homes and hear English only at school.

With the Plato program, students are showing "immediate improvement in both achievement and attitude," Santos said.

The Knox system uses four Plato terminals connected to a CDC Cyber mainframe in Arden Hills, Minn. Another school in the San Antonio school district, Douglass Elementary School, also uses four Plato terminals connected to the same mainframe. The Cyber monitors each child's progress and leads him through reading, math or language arts, depending on each student's individual needs.

The San Antonio Independent School District is one of 15 districts in the greater San Antonio area.



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Says NBS Should Take Lead Ware Urges Standards for Federal DP Security

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The National Bureau of Standards (NBS) should complete the work it began with the Data Encryption Standard and develop technical standards for instituting comprehensive computer security programs in all federal agencies, according to Rand Corp. Vice-President Willis Ware.

All DP managers must recognize the need for security even if their shops do not process sensitive information because computers are now "the lifeblood" of large organizations, such as federal agencies, Ware told a gathering of government DPers here last week.

A member of Rand's corporate research staff, Ware was a major contributor to the work of the Privacy Protection Study Commission. His talk last Tuesday covered various aspects of security and privacy and their effects on government agencies and industry.

Federal Agencies Lagging

The federal civilian agencies are understandably behind the defense agencies in implementing computer security programs, Ware noted and suggested that one central source of direc-

tion is needed to bring the various departments in line with up-to-date security practices.

Private industry, by comparison, has moved more rapidly in this area even though "it took a few fires, a few bombings and a few sprinklers that went off inappropriately" to spur them to action.

This is not to say, he continued, that federal agencies have not recognized the need for computer security. "I regard the Privacy Act of 1974 as a blessing in disguise," Ware said, because agencies, forced to protect the confidentiality of information in their data banks, had to reevaluate their computer systems and recordkeeping practices.

However, he continued, "I don't see any organizational structure that can cause all those agencies to march to the same drummer on security."

Need for 'Central Agent'

Ware praised the Office of Management and Budget for instituting guidelines for agency data security programs, but said there is need for one repository of technical assistance and information to which agencies can turn in implementing those programs.

"In government there aren't all that

many options for a central agent" of this kind, he said. Because the NBS Institute for Computer Sciences and Technology (ICST) is charged with assisting federal organizations in all aspects of computer operations, ICST is a likely candidate for taking the lead in providing needed technical information on security.

Referring to ICST development of the Data Encryption Standard, Ware said it "ought to finish that job and tidy up the rest of the security matters." If NBS "would step out smartly" on this issue and produce federal information-processing standards for security, all agencies would be forced to fall in line.

Such standards would also result in vendors offering hardware and software that comply with these mandatory security specifications, he added.

Future Dangers

Looking to the future, Ware argued that advances in computer applications will necessitate corresponding advances in security techniques.

Protecting centralized data bases and ensuring the integrity of telecommunications has already been accomplished, he said, but not much thought has been given to protecting the "data pools" or "data puddles" created in distributed systems as bits of information are moved about the country for one-time processing, updating or error correction.

But if there is any one, overriding danger to society because of lax computer security and privacy safeguards, Ware said it is that there is no comprehensive discussion of the issues.

Future troubles involving record-keeping practices will come, he predicted, not from a Big Brother type of computer abuse but from a proliferation of small, contradictory policy decisions, all of which seemed good at the moment they were made. However, over a period of time their inconsistency and incompatibility can lead to degradations of personal privacy.

'Composite Drift'

"It will be some composite drift toward an unfortunate future that has to be protected against," according to Ware. Congress, he said, debates regulating networks — such as the Federal Bureau of Investigation's National Crime Information Center — but has not started to grapple with what kind of policies should be advocated.

"I don't know where we stand as a country on all these information-based issues," Ware concluded, but went on to express optimism nevertheless about the long-term outlook. There will be more and more congressmen, Capitol Hill staffers and agency officials who possess a "high information IQ," he said, and a lot of these issues will be taken care of "simply because they are second nature" to the upcoming generation of decision makers.

Personal Computing Raises Thorny Privacy Issues

WASHINGTON, D.C. — Of all the technological trends raising thorny issues of privacy, security and government regulation, personal computing may prove to be one of the most troublesome, according to Rand Corp.'s Willis Ware.

Addressing an interagency group of federal DPers here last week, Ware predicted personal computing will be "the CB radio of the future," making possible "all kinds of mischief."

Seminar on DDP Set in Phoenix Next Month

PHOENIX — Honeywell, Inc. is offering a five-day seminar on distributed data processing (DDP) here March 17-21.

Aimed at senior systems analysts, DP consultants and middle management personnel involved with information networks, the seminar will present a top-down approach to information networks, and the distributed environment.

The seminar will use a product-independent frame of reference, Honeywell said.

Classes of networks will be examined and presented in terms of the various types of nodes and their interconnections with DDP and distributed data bases, Honeywell said.

The seminar costs \$675 including registration, documentation and five lunches, Honeywell said from its registrar's office, Honeywell System Sciences, P.O. Box 6000 (M.S. T60), Phoenix, Ariz. 85005.

In the long run, however, the public growth in computer knowledge that personal computing will foster will be highly beneficial to the U.S.' increasingly automated society, he added.

In the short term, how will Congress deal with the regulatory questions raised when networks set up by personal computing buff's compete with the Postal Service? Ware wondered.

And what will happen when those buff's join in networks with radio buff's, a situation that will arise in the amateur arena as surely as computer and telecommunications technologies have already merged to the regulatory dismay of the Federal Communications Commission?

Surely there will also be "computer blue-box freaks," he said. If electronic hobbyists can steal long-distance telephone time from AT&T, they can certainly learn how to take telephone-based data bases for a free ride.

Public Awareness

But a number of very big pluses will come of all this, Ware was quick to add. As millions turn to personal computing, a higher public information IQ will result — a trend of great importance as government and private institutions continue their migration to almost total reliance on computers.

A government based on computer power cannot realistically expect informed citizen feedback if the public is ignorant of how computers work, Ware noted.

"We're surrounded by recordkeeping systems we have to interact with," he said. It is necessary to know how to deal with computer systems in order to challenge them when necessary to protect privacy, economy and humanity.

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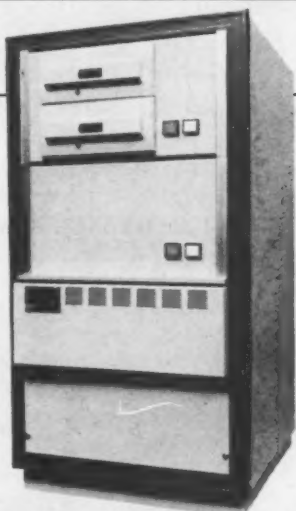
The CPU employs three microprocessors, the 6502, the Z-80 and the 6800. And the processor bus has been designed so new, more powerful micros (like 16 bit CPUs) can be added to the system later on.

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Series, the C3-B. Its specifications are the same as those of the C3-C. However, the C3-B offers a 74 Megabyte Winchester drive.

For those who do not need hard disk capacity now, but in all probability will need it in the future, Ohio Scientific offers the C3-A. It is like the C3-B and the C3-C in all respects but two. 48K RAM is standard in the C3-A, and it offers 12 open slots. When more storage is needed, the C3-A is easily expandable to either a 23 Megabyte or 74 Megabyte hard disk system. The C3-A is priced at less than \$6,000.

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AT&T 'Premarketing' Dataphone II: IDCMA

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — A major battle began shaping up at the Federal Communications Commission (FCC) last week over AT&T's proposed Dataphone II, a troubleshooting service for private-line networks.

The key issue is whether the phone company has been "premarketing" the service, thereby discouraging data communications users from acquiring similar, already developed systems manufactured by others.

Promotion of Dataphone II began many months ago. By last October, tariffs had been filed in 39 states. That month, an interstate version of Dataphone II was formally unveiled at the Information and Management Exposition and Conference in New York [CW, Oct. 22].

On Oct. 26, an interstate tariff covering Dataphone II was filed at the FCC. The tariff is scheduled to become effective Feb. 29, even though AT&T has announced that first shipments of Dataphone II hardware will be delayed

until some time after that date.

The delay was announced last month [CW, Jan. 28]. Because the "complexity of the system" was "underestimated," AT&T said, first shipments would slip one to three months.

"Case for Tariff Rejection"

The latest development came earlier this month, when the Independent Data Communications Manufacturers Association (IDCMA), which represents many of the companies that make systems competing directly with Dataphone II, angrily denounced AT&T for allegedly premarketing Dataphone II.

In a petition to the FCC, IDCMA argued that if the pending tariff "is not rejected, AT&T, by its own admission, will be unable to comply with Section 201 of the Communications Act, which requires carriers to offer services to users upon reasonable request."

Although AT&T has "asserted that Feb. 29, 1980 is the effective date of

Dataphone II service," IDCMA said, the January announcement "demonstrates that this date is a total nullity ... None of the tariff provisions, charges, or regulations will have any applicability on Feb. 29, 1980. No orders will be processed, no delivery dates will be quoted and no equipment will be installed on that date. In short, AT&T has admitted that nothing will become 'effective' on that date ... Rarely has the commission been presented with a clearer case for tariff rejection."

The association's major allegation, however, is that AT&T knew some time ago it would not be able to deliver Dataphone II hardware on the date promised, but said nothing and continued to promote the service.

Last October, when AT&T submitted its tariff application for the proposed service to the FCC, the company included cost support material which, according to IDCMA, indicated "that Dataphone II equipment items would not be available in commercial quantities on the effective date of the tariff." The association raised this point at the time by asking the phone company to reaffirm that it would be able to offer the service when promised. This request was refused, in effect.

However, the announcement in January that shipments would be delayed "confirms IDCMA's well-founded suspicions," the association said in its latest petition.

Revised Dates

Originally, AT&T said it would begin shipping Dataphone II hardware in February and March of this year. The system includes four modems — the 2024A, 2048A, 2048C and 2096A — plus a network controller and diagnostic console.

According to the phone company, the 2024A and 2048A modems, which were originally scheduled for shipment this month, will now be shipped in March and May, respectively. First shipments of the 2048C and 2096A

modems, originally scheduled for March, will now take place in May and June, respectively.

The network controller and the diagnostic console, which AT&T planned to ship this month, will not be available until March.

IDCMA told the FCC the delay is likely to be considerably greater than indicated above, however. The association pointed out that the new dates represent only the beginning of shipments, not the general availability of each product, and AT&T admitted in January that it's "production buildup," subsequent to the first shipments, would be more gradual than originally planned.

This "more gradual controlled introduction program is necessary to allow for the detection and correction of unforeseen problems before large numbers of systems are placed in service," AT&T added.

The phone company did not say how long the "detection and correction" period would last, but did estimate how many units of Dataphone II components it expects to produce by the end of this year. IDCMA, after comparing this data with similar figures submitted last October with the original tariff petition, concluded that the quantities AT&T plans to ship in 1980 have been reduced 69% to 73% and the phone company's "more gradual introduction program" will "extend into 1981 for many Dataphone II equipment items."

Seminars to Eye Performance

SAN FRANCISCO — A seminar on capacity planning will be held here March 10-12 so participants can determine what impact work load additions will have on a system's performance. It is planned by the Technology Transfer Institute.

A second seminar will be held in Chicago April 21-23 to offer "practical, reliable and cost-effective tools" to analysts who want to estimate and appraise a new system's ability to handle present and future work loads.

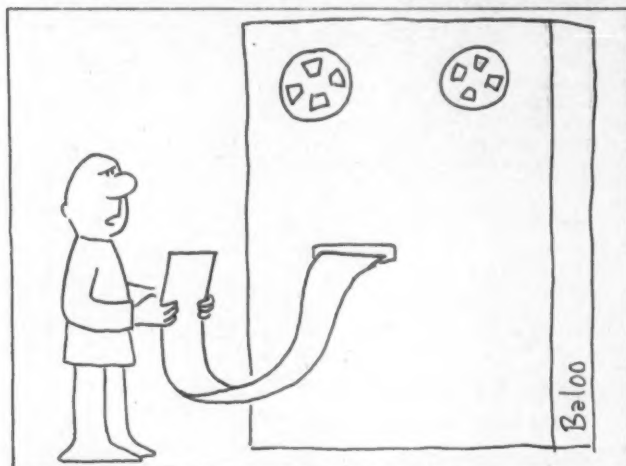
The cost for each seminar is \$675. The institute can be reached at P.O. Box 49765, Los Angeles, Calif. 90049.

Course to Probe 1100 Productivity

WASHINGTON, D.C. — Users of Univac 1100 mainframes can take a five-day course here that describes tools and techniques to improve the performance and productivity of their large-scale systems. The course is being offered by Applied Educational Services (AES).

The April 21-25 course will show how to use accounting systems and software and hardware monitors to diagnose performance problems on the 1100. It will also show how to set up and organize a performance management program.

Tuition is \$695, which includes several hundred pages of course notes. Reservation forms and information can be obtained from AES, 5222 Dunleigh Drive, Burke, Va. 22015.



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Software and Hardware Headaches

Washington, D.C., Financial System in Disarray

By Tim Scannell

CW Staff

WASHINGTON, D.C. — Although designed to straighten out the city's ailing and outdated accounting methods, the District of Columbia's four-and-a-half-month-old automated financial management system has already created a number of hardware- and software-based headaches. And relief could be more than a year away, according to one city official.

Operational since last October, the system is responsible for a multitude of administrative delays, financial mistakes and work slowdowns. For instance, in December the system neglected to send some \$11 million in municipal withholding taxes to the U.S. government.

In addition, scores of workers contracted by the city have waited months for checks while an undertrained financial staff figures out how to get needed data into the complicated system.

To compound matters, the system is down about 50% of the time and has very slow response times when it is running, day-to-day users of the computer have claimed.

"The system is infinitely more demanding and sophisticated than what we were doing before," Colin F.S. Walters, assistant city administrator for financial management, stated. And for the most part, "we've had to make this great leap on the basis of some rather scanty and superficial training."

Designed and installed by American Management Systems, Inc. (AMS) and paid for with federal funds, the system consists of two IBM 370/165s with a combined total of about 12M bytes of memory. The system also has around 200 CRT terminals scattered throughout the city's departments.

The DC computer system is patterned after a similar financial package installed by AMS in New York in mid-1977. However, there is where the similarities end. While the Big Apple's computer is working fairly well with a few minor problems, DC's system is plagued with a variety of troubles.

Software Snags

The principle problem area is in the system's software, in particular a disbursements subsystem that is supposed to keep track of and pay for contracted workers or services. Because of subsystem malfunctions, city workers have had to write out payment checks by hand, avoiding the help of the computers which have already gobbled up \$20 million of \$38 million in congressional appropriations.

To further complicate things, the system is supported by IBM IMS software which "has proved to be susceptible to unexpected mishaps" and frequently knocks the whole financial network down at unexpected times, Walters pointed out.

IBM people are currently working to iron out their half of the system's problems, but the IMS seems to be constantly running afoul of AMS' financial management software, he added.

The second major problem lies with the staff of several thousand employees who are significantly undertrained and unfamiliar with the workings of

the system.

Although AMS provided some on-the-job training, the city has had to contract the University of the District of Columbia and Urban Academy, Inc. of New York to help fill in the educational gaps. The latter firm is especially beneficial since it supplied the training and manuals for the New York financial management project, Walters said.

As if software problems were not enough, the system has also been harassed by quite a few hardware difficulties. I/O channels have occasionally broken down, telecommunications facilities have failed and terminals have ceased to function when the

mainframes are operating fine, Walters noted.

"I don't know whether our hardware will prove adequate in the long run," the assistant city administrator observed, although he admitted that he wasn't ready to scrap the system.

Future Pitfalls

Finally, Walters claimed that a potential problem looming in the future exists in D.C.'s inability to attract additional and qualified systems analysis programming people — a difficulty plaguing most government agencies because of current pay scales and opportunities.

"We're finding it very hard to equip

ourselves as a team that is good enough to maintain this thing," he said, referring to the operation of the system.

On the bright side, however, Walters noted that the system is "cranking along" and the city just completed its first computerized balance sheet audit.

The financial management system was mandated by a federal agency called the Temporary Commission on Financial Oversight of the District of Columbia when the city assumed limited home rule powers in 1975. Designed to simplify the auditor's task, the automated system keeps track of the city's annual \$1.5 billion budget.

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Wang Institute to Open Its Doors in September

By Marcia Blumenthal

CW Staff

LOWELL, Mass. — The information sciences industry created a new industrial revolution, but the talent needed to direct that revolution is in short supply — a fact that has long appalled Dr. An Wang, chairman and president of Wang Laboratories, Inc.

To alleviate the shortage, Wang decided to form the Wang Institute of Graduate Studies, which will open its doors in September.

Although the institute will be a fully accredited graduate school, Dean Ugo O. Gagliardi considers its program unique: The program is geared to the needs of industry.

"Traditional university programs ignore the issue of how you get large bodies of people organized to develop software products. The business of developing a large software project is not even considered in university curricula," Gagliardi noted.

The Wang Institute will not offer the traditional university-based program, which often attracts students primarily interested in teaching. Instead, it is



Shown left to right are Jack R. Bohlen, Dr. Ugo Gagliardi, Dr. Caroline Wardle and Dr. An Wang.

aiming to train software engineers eager to work for computer industry vendors.

The initial course emphasis will be on operating system design, but will be expanded to include applications de-

sign within the next few years, Gagliardi said. At that time, the fledgling institute will begin to accept systems designers from sophisticated user organizations.

To blend the institute's academic and industry perspectives, Gagliardi is now recruiting professors with a background in both disciplines. "We will pay faculty industry-competitive salaries. People you would want to hire to teach state-of-the-art [techniques] are already working in industry," he pointed out.

The institute intends to have three full-time faculty members by September, Associate Dean Dr. Caroline Wardle said.

Practicing what he preaches, Gagliardi is currently on leave from Harvard University where he is a Gordon McKay professor of the Practice of Computer Engineering. He also worked in industry for many years; one of his positions was as technical director for the development of Honeywell, Inc.'s Series 60 equipment.

Entrance Requirements

Rather than start an undergraduate program, the institute opted for a graduate program. The most significant industry need is for first-line supervisors, project leaders and software architects, Gagliardi said, so a bachelor's degree is assumed. Summing up the institute's program, Gagliardi called it a "professional master's degree program."

Students seeking entrance to the program will be required to have a background in computer science, engineering, mathematics or some related field and the equivalent of two years' work experience. The institute will accept the equivalent of 30 to 40 full-time students for its first academic year.

However, since 85% of the first year's students will continue to work while studying, Gagliardi estimated, about 60 students will actually be enrolled in the program.

Working students will attend the institute two half-days per week for two years including summers. Full-time students can complete the program in 12 months.

Tuition is \$5,600 annually, but the cost of educating one student is about \$20,000, Gagliardi said, explaining the difference will be made up through the school's endowment. The Wang family endowed the institute with a \$3 mil-

lion bequest last year.

The institute's initial curriculum includes 11 three-credit courses, including such core courses as programming methodology, software engineering and the application of formal methods to software development. A grounding in management sciences will also be given.

Three electives will provide students with the chance to specialize in areas such as compilers and data base systems.

A two-semester project will replace the traditional master's thesis. Vendor companies in many cases will be supplying these projects for students.

Multivendor Atmosphere

Moreover, Gagliardi stressed, students will have an abundant opportunity to interact with systems: "Access to computer power will be as natural as getting a drink of water." The institute plans to have one terminal for every two students.

Right now the institute is soliciting vendors to donate equipment. "We want our computing capability to be multivendor," Gagliardi emphasized. "We don't want people trained exclusively on any one system."

In developing its objectives, the Wang Institute has put together a nine-member advisory committee made up of individuals from both academia and industry. And this month the institute is meeting with representatives from 25 to 30 vendors and user companies interested in learning more about the program, according to Jack R. Bohlen, vice-president of the institute.

The institute's facility, which will be ready in May, will be located in a bucolic 200-acre setting in Tyngsboro, Mass., the former site of a Marist Brothers seminary.

More information about its program is available from the Wang Institute of Graduate Studies at One Industrial Avenue, Lowell, Mass. 01851.

Minis, Micros To Be Explored

NORCROSS, Ga. — The American Institute of Industrial Engineers (AIIE) will sponsor a seminar in Atlanta on May 9-10 dealing with the basics of minicomputer and microcomputer operations as well as the limitations and costs of small business computer systems.

Designed for managers who need an overall knowledge of small computers, "Mini-Micro Computers — What Every Manager Wants to Know" will present a variety of speakers who will discuss how they manage their hardware and software applications and handle manpower and other resources.

Speakers will include Vincent Raunzio, director of marketing and consulting for Datapro, Inc.; John W. Sims, supervisor of systems development for Marathon Oil Corp.; and Sylvia Hartstein, a management consultant with Booz, Allen & Hamilton.

The registration costs \$250 for AIIE members and \$290 for non-members. Additional details are available from the group at 25 Technology Park/Atlanta, Norcross, Ga. 30092.

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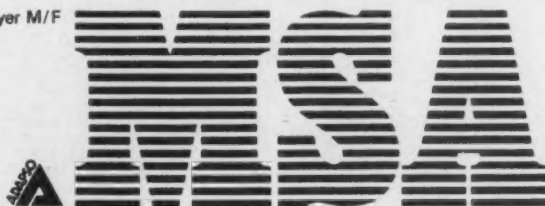
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Women in DP Call Their Lives a 'Juggling Act'

By Connie Winkler
CW Staff

NEW YORK — For women in data processing, life can be a kind of juggling act, and a snapshot of their lives emerged at a meeting sponsored by Women in Data Processing here recently.

About 150 women and a few men heard five women say they truly enjoy their DP jobs, but the long and unpredictable hours made the juggling act more difficult.

For Susan E.K.A. Fleischer, a senior systems analyst at American Can Co., her job meant being hunted down on a movie date when her system went down.

"It's difficult for people outside DP to understand the hours you are required to keep and the problems," Molly Nemhouser, a senior systems analyst with Moccata Metals agreed. She acknowledged she spent more time at her job when first joining a company, but then leveled off and went back to other aspects of her life, which currently include working on an M.B.A. and playing tennis regularly to break the tension in her life. She is now single.

"Women in data processing tend to put in more hours," said Nancy R. Jordan. "They

feel more dedicated as they look ahead because they don't see many other women," Jordan, formerly with IBM, is now a vice-president at Citibank in domestic money transfer computer services. She is married with no children.

'Have to Be Superwomen'

"Too many of us think we have to be superwomen and that no one else should share our problems," said Christine M. Millen, who moderated the session. Millen is now a senior manager of management advisory services for Price, Waterhouse & Co.

Women struggle and juggle their lives and careers in obvious ways, but also in subtle ways, Millen said. They also contend with mental guilt and pressures from other people.

Finding a balance between jobs and personal lives is a struggle for all the women, they indicated. Mary Lynn McCaffery, who manages a systems staff at Citibank, places a high priority on spending time with her children. In fact, she took six years off from her career when they were very young. "There are trade-offs," McCaffery said. "You have to recognize what your values

are."

Juggling is always a question of fixing priorities. "When there seems to be no time left, but there is something you want, it will get done," Nemhouser said. "You see in two weeks what got left behind."

Priorities change day to day, Millen added. "Don't feel guilty because one day it's a sick child, another day it's a business trip. And, don't feel guilty because you change your priorities," she advised.

Millen, who is now single with two children, copes with the juggling act with the aid of

a live-in housekeeper.

All the women reported feeling guilty about housecleaning; several have cleaning help.

"We have been socialized to be good housekeepers. We want to be social women — to be able to do everything ourselves without depending on other people," Nemhouser said. "I now devote my time to things that will further me in my career."

Men who live alone don't feel guilty about having a housekeeper, Jordan said.

To ensure that they and their mates don't become "ships

passing in the night" — to use their words — the women arrange for at least weekly dates with their mates. Fleischer even makes it a dress-up date.

And the women watch out for themselves. Millen suggested the word "selfish," but McCaffery recommended "self-interested."

"You have to take care of yourself or you are not going to be prepared to take care of anyone else," McCaffery said. She recalled the resentment she felt building when she was at home but wanted to go back to work full-time.

Steals Four Circuit Boards

Thief Disables Brain Scanner

By Jeffrey Beeler

CW West Coast Bureau
PALO ALTO, Calif. — Patient care in the Stanford University Medical Center's Radiology Department ground to a halt for almost 12 hours earlier this month when a thief posing as a service engineer swiped four circuit boards from the CPU controlling the department's brain scanner.

The loss of the two processor boards and two memory boards brought both the scanner and its associated Data General Corp. Eclipse S/200 to a standstill until hospital staffers found temporary replacement parts at a General Electric Co. warehouse in nearby Mountain View.

Staff members returned the borrowed boards when permanent replacement parts arrived from a Data General plant in Westboro, Mass., according to Norman Briggs, administrator of the Radiology Department's Diagnostic Division.

The interruption in scanning operations caused no serious health care problems.

The theft occurred sometime during the early morning hours of Feb. 6 after a man claiming to be a field service engineer appeared unexpectedly at the Radiology Department's diagnostic area and told an on-duty attendant he had come to repair the scanner's 128K-byte processor.

Convinced of the man's authenticity, the attendant unlocked the scanning room door and let the phony service engineer in to make his "repairs." A few hours later, four Eclipse S/200 processor and memory boards were discovered missing.

Police have launched an investigation into the case but have yet to make any arrests. Until they do so, Briggs said local law enforcement officials have asked the medical center's personnel not divulge

any details about how the heist worked.

The attendant who admitted the thief to the Radiology Department's scanning room had no reason to doubt the "repairman's" credentials, Briggs said, because the area is the scene of many surprise maintenance visits, even during the wee hours of the morning.

Exactly what the thief intends to do with the four stolen circuit boards remains unclear. He might have wanted them as parts for his own personal computer, or he might have planned to sell them on the electronics black market, where they would fetch a total of about \$4,000 to \$5,000, Briggs said.

Directly from their vendor, the boards cost a total of about \$17,000, medical center sources estimated.

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NBA Star Chosen by DP Ballot

LANDOVER, Md. — A computer was instrumental again this year in the selection of George "Ice Man" Gervin as the National Basketball Association (NBA) All Star game's Most Valuable Player.

With a computer to process the vote at the East-West game here at the Capital Centre, sportswriters could wait til nearly the end of the game before making their choices. Gervin, who played for the East, contributed to that team's 144-136 win over the West.

The computing facilities were provided by Honeywell, Inc., and included a Level 6 Model 33 with 128K bytes of memory, 10M bytes of disk storage, a VIP 7800 CRT terminal and a 300 card/min reader.

To register their votes, the sportswriters selected a ballot from either of two packets in front of them —



George 'Ice Man' Gervin

one for the East and one for the West. Each ballot bore the pre-printed name of a player on court.

It was necessary only to sign the appropriate card and hand it to a volunteer. The card reader read the votes and tabulated the results in seconds.

Assembly Language Programming To be Topic of IEEE Tutorial

WORCESTER, Mass. — The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is offering a two-day tutorial course on Assembly language programming here at the Sheraton Lincoln Inn, March 7.

The course is intended to acquaint engineers, programmers and technicians with the basic Assembly language programming methods for common microprocessors, IEEE said.

The course will provide an introduction to microprocessor Assembly language for the Intel Corp. 8080/8085 processor. Course material is directed toward solving engineering problems, using a textbook by Dr. Lance Leventhal, IEEE said.

The course costs \$165 for IEEE members and \$205 for nonmembers, the organization said from 445 Hoes Lane, Piscataway, N.J. 08854.

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Bibliography of DP Books Lists 250 New 1979 Entries

By J. Daniel Couger
Special to CW

After seven years of relatively stable output, the number of new computer books increased 25% in 1979 when more than 250 books were published.

All are listed in the 13th edition of the *Annual Bibliography of Computer-Oriented Books*, released this month by the University of Colorado.

Accompanying the increase in quantity was an increase in the quality of books, particularly in the area of distributed systems and special programming languages. Conversely, of the 18 new books on DP management, only seven are noteworthy.

The quality of books in the advanced programming category is excellent, continuing the trend of the past three years. Nineteen new books were published in that area. While there was a surprising decline in the number of new books in the application areas (only 20), the increase in books on microcomputers and personal computing (14) will hardly be a surprise.

All introductory-type books published prior to 1975 were deleted. Despite the deletions, the bibliography still contains more than 1,000 books from over 150 publishers. The bibliography separates the books into 55 categories and catalogs them according to type (reference, textbook, handbook) and style of presentation (programmed instruction, case study or narrative).

Programming Books

Of the 107 new programming books, 58 fall into the advanced programming category. Harlan Mill's new book *Structured Programming* is a valuable contribution to the field, as is *The Art of Software Testing* by Glen Myers.

The 23 new system design books reflected a continuation of last year's trend, with the section on distributed systems expanding more than 50%. *Distributed System Design* by Mariani and Palmer is an example of the high quality books available on that topic.

The section on structured design now contains 11 books. Additions to the systems area included five data base books and four MIS/DSS books. In the latter category, the comprehensive scope of *Information Resources Management* by Forest Horton makes it an important addition to the field.

DP Management

Eighteen new books on DP management debuted. In this 62-book category, one new subsection is on managing software projects. New books in that subsection are *Software Management* (Reifer) and *Software Life Cycle Management* (Basili).

There are now 10 books in the project management section and five in the personnel performance section. A new book in the latter category is Greenbaum's *In The Name of Efficiency*. A newcomer in the system security section is *Computer Crime Investigation Manual* by Schaback.

The section on microcomputer books contains 14 listings, including new books on design and on applications. An example in the latter category is *Computer Power for the Small Business* by Sippl and Dahl. This section also includes six books on personal computing, such as *How to Make*

Money With Your Microcomputer by Townsend and Miller.

The bibliography contains 12 categories on computer applications. Only 20 books were added to this section. Nevertheless, the quality of the books remains satisfactory, with the addition of books like Tom Naylor's *Simulation Models in Corporate Planning*.

Programming Languages

Books on programming languages continue to proliferate. The trend to convert traditional books to a structured approach improved the quality of this section. Examples are *Problem Solving and Structured Programming in Basic* (Koffman and Friedman) and *Structured Fortran Programming* (Dock).

The new section on Pascal now contains seven books. Basic took over the lead from Fortran in the number of new books, with 20. Variations of PL/I (such as PL/Zero, PL/C, PL/M and PL/Z) caused this language to come in third, with seven additions to the field.

A new language added to this section was "C." Two books were published in 1979, including the *C Programming Language* by Kernighan and Ritchie. Four books on the Mumps language were added to the bibliography. Only one book was published on RPG.

Copies of the bibliography are available for \$4 from Computing Newsletter, Box 7345, Colorado Springs, Colo. 80933. The cost is \$6 if an invoice is required.

Couger is a professor of computer and management science at the University of Colorado.

Boeing Division Training Center Opens in Seattle

MORRISTOWN, N.J. — Boeing Computer Services Co.'s (BCS) Education and Training Division recently opened a National Training Center in Seattle.

The center, BCS' largest to date, will provide training to corporate and governmental workers. Regularly scheduled classes are slated to be offered on a variety of DP subjects as well as some related, non-DP subjects, a spokesman said.

The Seattle building will house a Hewlett-Packard Co. 3000 Series III minicomputer as well as provide access, via time-sharing, to IBM and Control Data Corp. systems, a spokesman said. A minicomputer lab is equipped with terminals for hardware and software classes. The facility also features classrooms, a theater and a library, BCS said.

The National Training Center offers 70 to 80 courses on such subjects as Cobol, Fortran and computer graphics. Other BCS training facilities are in New York City, San Francisco, Detroit, Chicago and Washington, D.C.

Courses vary from one-day seminars to three-week courses. Prices also vary depending on the type and length of course.

The program is open only to corporations and government agencies, BCS said.

Managers on the Move

THOMAS H. SIMPSON has been named technical director of Amdahl Corp. in Sunnyvale, Calif.

Simpson is joining Amdahl after 15 years with IBM, where he earned the distinction of IBM Fellow. During his years with IBM, he was involved with the design of operating system software and was instrumental in the development of Hsp and JES2 subsystems for IBM operating systems.

He previously played a major role in developing operating system software for the Apollo lunar landing project.

Simpson is a graduate of the University of Texas, where he received a bachelor's degree in mathematics.

...

FREDERICK MEYERRIECKS has been promoted to assistant vice-president of DP at Eastern States Bankcard Association, Inc. in Lake Success, N.Y.

Meyerricks joined Eastern States in 1976 as a senior on-line programmer/analyst. Prior to his promotion, he was the director of data center operations.

He holds a B.A. in English from Queens College.

...

GARRY R. BEATY has been named director of corporate information ser-

Corporate DP Topic of Course

LOS ANGELES — A series of five-day seminars this spring, sponsored by the Technology Transfer Institute (TTI) here, will describe distributed processing, data base networks and office-of-the-future technologies.

Designed to give an integrated view of those technologies and the details necessary to design flexible, cost-effective systems for the future, the seminars will be held in Atlanta, Feb. 25-29; San Francisco, March 3-7; New York, March 17-21; and Chicago, March 24-28.

The course, led by James Martin, will also provide an overall management philosophy for corporate DP, with special emphasis on the office of the future. The registration fee for the five days is \$1,150, which includes all documentation, lunches and breaks.

Further information is available from TTI, P.O. Box 49765, Los Angeles, Calif. 90049.

Telecommunications Topic of Seminar

LOS ANGELES — Technology Transfer Institute (TTI) here is offering a one-day seminar aimed at explaining telecommunications issues to managers.

Headed by TTI's James Jewett and Jacqueline Shrago, co-founders of Telco Research Corp., the seminar will identify management perspectives and evaluate the economic trade-offs of mixed voice data networks, ACDs, PABXs, integrated systems and related applications.

The seminar is scheduled March 19 in San Francisco, April 10 in Chicago and April 25 in New York. It costs \$225 including all documentations and lunch.

TTI can be reached at P.O. Box 49765, Los Angeles, Calif. 90049.

vice at Petrolane, Inc. in Long Beach, Calif.

Beaty came to Petrolane in January 1979 as assistant director, corporate information service. Previously, he was operations manager of management information systems at Western Gear Corp. and held various DP posts at Paccar, Inc.

He will be responsible for all the department's activities.

...

LESLIE J. LAMMERS has been appointed an assistant vice-president of Morgan Guaranty Trust Co. in New York. She is in the Management Information and Profit Analysis Department.

Lammers joined Morgan in 1979 as

an assistant treasurer.

She is a graduate of the University of Texas with a B.B.A. degree.

...

GEORGE C. TATTER has been named director of information systems at Applied Data Research, Inc. in Princeton, N.J.

Tatter was formerly employed with Peat, Marwick, Mitchell & Co. as a consultant in DP systems and accounting. He has most recently been manager of management consulting in the company's Newark, N.J., office.

Tatter is a graduate of Rider College.

...

LARRY D. SLAIGHT has been promoted to vice-president of DP at

Farmland Industries, Inc. in Kansas City, Mo.

Slaight was employed by Far-Mar-Co., Inc., Farmland's grain marketing subsidiary, in 1971 as a systems representative. Most recently, he was executive director of DP marketing in Hutchinson, Kan.

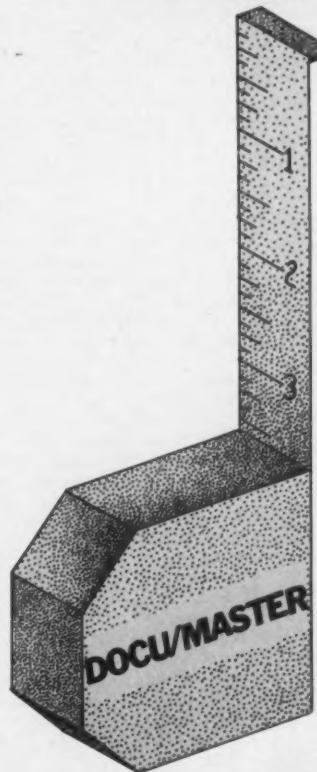
Slaight attended the University of Georgia and Brown-Mackie College.

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ROBERT A. CRAVEN has been appointed vice-president of operations and systems for Optimum Systems, Inc. (OSI).

Craven will be responsible for the planning and evaluation of corporate hardware, software and technical development activities.

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Politics Seen Block to Global Data Links in '80s

By a CW Staff Writer

WASHINGTON, D.C. — In the decade ahead, technological progress by itself could spread linked data bases further apart, reduce the dollar costs of broadband traffic and ease the interconnection of different types of systems.

But, according to MIT Prof. Ithiel de Sola Pool, the plight of data communications users will be determined by political as well as technological factors. In fact, nationalism may badly constrain efforts to establish global links for reliable, high-speed transmission of information, the director of MIT's Center for Communications Policy observed at a recent conference here.

Pool drew a distinction between what technology promises and what politics may allow the 1980s user. "If politics and human factors did not enter the picture," he told a conference session, "that would lead me to forecast a series of global competitive networks ... serving a variety of purposes [while] interconnected but not confined by national boundaries."

Political Restraints

"If technology were the only consideration," Pool continued, "one might expect a situation to develop in which users in any country could become the customers of any service that [attracted] them via one or another ... long lines connection."

Notwithstanding progress in what machines can do, the key issue before the 1980s user is what machines may

do within the context of political processes, Pool suggested. National governments, not research and development laboratories, will restrict the networks carrying data across borders.

Governments around the world will probably interconnect state-owned utility monopolies such as the postal, telephone and telegraph authorities in Europe, Pool said. But that is "not the same thing as a global market of a variety of networks."

Transborder data flow restrictions would generally hurt countries of "less than continental size," the MIT professor stated. Nations other than the U.S., Soviet Union, Canada, Brazil, India and China "are clearly suboptimal in size from the perspective of satellite ... and specialized network technology."

By enforcing rigid standards for data network devices, protocols and methods, the smaller countries would diminish significantly the range of communications services accessible to their users.

Then why set such restrictions? No government relishes dependence on foreign carriers for a function as vital as telecommunications, Pool noted.

Two aspects of transborder data flow that any government would like to control as completely as possible are privacy — since interception of sensitive data traffic may compromise severely the security of government or commercial interests — and reliability — since an unexpected cutoff of information can be just as devastating as a

cutoff of petroleum products.

Another political phenomenon Pool expects to affect this decade's data communications is public policy on competition in each country's communications marketplace. In the U.S., government is "clearly" inclined to stimulate competition through such regulatory bodies as the Federal Communications Commission, Pool said.

In other countries, however, state-owned monopolies are gaining control of the equipment and services available to users, he said.

Vendor Interrelationships

A third political constraint on communications is how the major vendors and carriers will mobilize with respect to one another. The largest communications sellers, such as monopolies from various countries, may discover they cannot address very specialized user needs, Pool pointed out.

Alluding to firms like AT&T, Pool

said "there is no natural technical limit on what companies that started out as telecommunications carriers can do ... but large bureaucratic organizations have some real disadvantages because of their size."

Bell and similar organizations shy away from offering customized service because they do not wish to set precedents for departing from standard practices, which are much easier to administer on a large scale. Such firms cannot afford to handle many customers that demand tailor-made functions.

Hence, "there will always be innovative services that lean, young, aggressive companies can carve out of the whole and do at a profit," the professor said.

"How big these [companies] become and how firmly established depends more on entrepreneurship ... and government policy than it does on technology," he concluded.

Iowa-Based Projects to Study Instructional Uses of Micros

IOWA CITY, Iowa — Conduit, a University of Iowa-based nonprofit organization that reviews, tests and distributes computer-based instructional programs, is investigating possible ways to expand microcomputer use in education.

Through two projects — the first funded by the National Science Foundation (NSF) and the second supported by the Fund for the Improvement of Postsecondary Education — Conduit intends to determine the feasibility of increased microcomputer use in schools.

The NSF project is broken into two phases, the first an 18-month experimental period, followed by a second phase in which materials are disseminated.

The experimental period was designed to review the suitability of converting to microcomputer systems some current projects now running on time-sharing. The advantages offered by microcomputers — such as audio, color, graphics displays and various input devices — will be examined, as will ease of implementation.

In addition, the project will seek to determine whether time-sharing is in fact a better choice than microcomputers in some cases. Conduit will also examine the feasibility of developing programs from scratch rather than converting them from another system, according to Hal Peters, Conduit's associate director.

The reliability capabilities and instructional effectiveness of existing computer-based learning — as opposed to microcomputer-based learning — is another area that the project will cover.

Once all information is gathered, Conduit plans to prepare a set of guidelines for microcomputer instructional materials in general, as well as for those relating to specific popular systems.

The second phase of the project will be to distribute those materials and programs that are judged to be worth converting from time-sharing to microcomputer-based systems. Distribution will be accomplished through Conduit's normal mail-order channels, as well as through computer retail stores and microcomputer vendors.

Four disciplines will be examined in this experiment: mathematics, physics, chemistry and biology. Topics in advanced undergraduate instruction will be emphasized.

The other project undertaken by the organization focuses on the need for dissemination of instructional materials to schools. Contending that computers in education have fallen short of their potential, Conduit plans to identify and distribute 35 microcomputer-based instructional modules in a variety of disciplines, including the humanities and social sciences, according to Peters.

One result of the project will be to provide examples, guidelines and standards for future development of materials.

To facilitate the projects, Conduit needs microcomputer-based materials designed and developed by instructors (or other authors) for reviewing and testing. Conduit pays royalty fees to the authors and, after testing, distributes material to other educational institutions — primarily colleges and universities.

Conduit began in the early 70s as an NSF-sponsored project to study problems of sharing computer-based instructional materials among different institutions. It can be reached at P.O. Box 388, Iowa City, Iowa 52244.

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March 10-12, Atlanta — Data Base Management System for Minis. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held March 12-14 in Chicago.

March 10-12, Dallas — Network-Tech Control Design and Operations. Contact: Data Communications, Mc-

Graw-Hill Conference & Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

March 10-12, Washington, D.C. — Effective Data Systems Development. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

March 10-12, Toronto — National Office Exhibition and Office of Tomorrow Conference. Contact: Whitted Publishing Ltd., Suite 2504, 2

Calendar

Bloor St. W., Toronto, Ont. Canada. M4W 3E2, Canada.

March 10-12, Chicago — Data Processing Operations Management. Contact: MC Seminar Division, 1307 E. 60 St., University of Chicago, Chicago, Ill. 60637.

March 11, Washington, D.C. — Office Automation Briefing and Workshop. Contact: Micronet, Inc., Watergate Mall, 2551 Virginia Ave. N.W., Washington, D.C. 20037. Also being held March 27 in Washington, D.C.

March 11, Wilmington, Del. — Microdelcon 80, sponsored by the Institute of Electrical and Electronics Engineers. Contact: Chuck Berg, E.I. Dupont de Nemours & Co., Wilmington, Del. 19898.

March 11-12, Washington, D.C. — Small Computer Symposium. Contact: American Institute of Industrial Engineers, Inc., 8810 Teresa Ann Court, Alexandria, Va. 22308.

March 11-13, Zurich, Switzerland — Semicon/Europa. Contact: Semiconductor Equipment and Materials Institute, Suite 212, 625 Ellis St., Mountain View, Calif. 94043.

March 11-14, Pacific Grove, Calif. — Fifth Workshop on Computer Architecture for Nonnumeric Processing, sponsored by the Institute of Electrical and Electronics Engineers. Contact: W.F. King, IBM, K51/282, 5600 Cottle Road, San Jose, Calif. 95193.

March 12-13, Washington, D.C. — Office Automation Planning Workshop for Managers. Contact: Micronet, Inc., Watergate Mall, 2551 Virginia Ave., N.W., Washington, D.C. 20037. Also being held March 25-26 in Washington, D.C.

March 12-14, Kansas City, Kan. — Check Processing Conference. Contact: Bank Administration Institute, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

March 12-14, Phoenix — Information Systems Conference for Users. Contact: Wordpro International, Suite 109, 2035 N. Central Ave., Phoenix, Ariz. 85004. Also being held March 26-28 in Denver.

March 12-14, Phoenix — Technical Symposium '80, sponsored by the Institute of Electrical and Electronics Engineers. Contact: H. James Martin, P.O. Box 21666, Station 1278, Phoenix, Ariz. 85036.

March 12-14, Chicago — Effective Computer Operations Management. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held March 31-April 2 in Los Angeles and San Francisco.

March 16-20, Denver — Honeywell Users Group Conference. Contact: Honeywell, Inc., 200 Smith St., Waltham,

Mass. 02154.

March 17-18, San Francisco — How to Manage Data and Information as a Resource. Contact: Barnett Data Systems, 19 Orchard Way No., Rockville, Md. 20854.

March 17-18, Orlando, Fla. — Computer Negotiations Workshop. Contact: International Computer Negotiations, Inc., 1331 Palmetto Ave., Winter Park, Fla. 32789.

March 17-19, Boston — Data Communication Services and Protocols. Contact: Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

March 17-19, Washington, D.C. — Electronic Mail: An Overview of Concepts, Systems and Applications. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 17-19, Dallas — Computer Performance Measurement: Tools and Techniques for Increased System Productivity. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held March 24-26 in Los Angeles.

March 17-20, Miami — Interface '80, cosponsored by Datamation magazine. Contact: Interface Group, 160 Speen St., Framingham, Mass. 01701.

March 17-21, Atlanta — Management Style: Self-Directed Growth. Contact: American Management Association, 135 W. 50 St., New York, N.Y. 10020.

March 17-21, Vienna, Austria — International Congress on Data Processing in Europe. Contact: Interconvention, P.O. Box 35, A-1095 Wien, Austria.

March 19, San Francisco — Telecommunications Management. Contact: Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

March 19-20, Frankfurt, Germany — IBM VM/CMS: Conference. Contact: On-Line Conferences Ltd., Cleveland Road, Uxbridge, England UB8 2DD.

March 19-21, Tampa, Fla. — 13th Annual Simulation Symposium, cosponsored by the Institute of Electrical and Electronics Engineers and Association for Computing Machinery. Contact: Sudesh Kumar, 1511 Tucker Lane, Encinitas, Calif. 92024.

March 19-21, Chicago — Computers in Manufacturing. Contact: American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

March 19-21, San Francisco — How to Build and Use a Data and Information Resource Directory. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

March 19-21, New York —

Computer Networks. Contact: Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

March 19-21, Arlington, Va. — National Association of Bank Servicers (Nabs) Semi-annual Meeting. Contact: Nabs, Suite 1331, 50 W. Broad St., Columbus, Ohio 43215.

March 20, Norfolk, Va. — Sixth Federal ADP (FADP) Expo. Contact: FADP Expo '80, HQ TRADOC, DPFO, Ft. Monroe, Va. 23651.

March 20-21 Miami — Interactive Computing and the DTSS Associates Plan. Contact: DTSS, Inc., 10 Allen St., Hanover, N.H. 03755.

March 20-21, Atlanta — Planning APLSV for the '80s. Contact: Interprocess Systems, Inc., Suite 112, 1260 Winchester Parkway, Smyrna, Ga. 30080.

March 24-25, San Francisco — The Successful Application of a Geographically Based Information System. Contact: Comaric Design Systems, 315 Bay St., San Francisco, Calif. 94133.

March 24-26, Washington, D.C. — Distributed Data Processing, Data Communications and Networks, Minicomputers. Contact: American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

March 24-26, Cherry Hill, N.J. — Data Entry Management and Supervision Seminar. Contact: Management Information Corp., 140 Barclay Center, Cherry Hill, N.J. 08034.

March 24-26, Los Angeles — Satellite Networks. Contact: Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

March 24-28, Houston — Data Base Modeling and Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

March 25, Dallas — Invitational Computer Conferences. Contact: B.J. Johnson & Associates, Suite 203, 2503 East-bluff Drive, Newport Beach, Calif. 92660. Also being held March 27 in Houston.

March 25-26, New York — The New IBM Network Strategy. Contact: Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02114.

March 25-27, Oklahoma City, Okla. — Southwest Computer Conference. Contact: University of Tulsa, 600 S. College, Tulsa, Okla. 74104.

March 25-27, Brighton, England — Electro-Optics/Laser International. Contact: British Information Services, 845 Third Ave., New York, N.Y. 10022.

March 27-28, St. Louis, Mo. — Datacom '80, sponsored by Data Processing Management Association and Association for Systems Management. Contact: Richard A. Bauer, P.O. Box 14490, St. Louis, Mo. 63178.

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Turnaround Time

By Larry E. Long

Q After eight months my partner, Pat, and I have just completed a report which may have a significant bearing on the direction of our company's data processing. Yesterday the inevitable happened — we were asked to give a one-and-a-half-hour presentation to the executive committee. We have about four weeks to prepare.

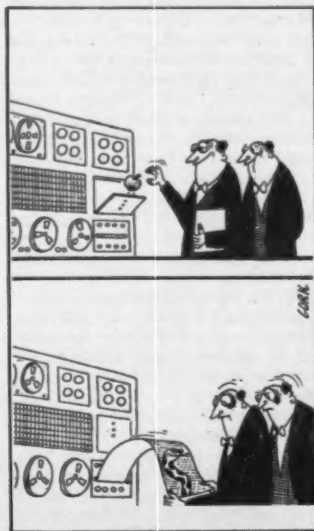
Pat has done a super job on the report, but it is widely known that Pat has had limited success in formal presentations. When not reading the transparency, Pat stares at the floor. A monotonic slow-talker, Pat will start heads nodding in four or five minutes.

I have mixed emotions about the presentation. I'm better than most in formal presentations, but would feel awkward doing the entire presentation.

A In the DP business, presentations are a part of life and Pat should learn to cope with this facet of his job. Skills in verbal communication can be learned and developed. Pat may never be a Grace Hopper or a James Martin, but with proper preparation and practice he could give an adequate-to-good presentation.

To make the most of your combined talents, I suggest that you start and end the presentation with Pat making two short (10- to 15-minute) presentations in between. To help prepare, get a good book on DP verbal communication and pick out important points to incorporate in your presentation. Ask a friend who is a skilled speaker for advice. Prepare an outline and begin the practice/feedback cycle. This time will be well spent, especially for Pat.

Even after the necessary skills have been developed, to be effective the presenter must gain confidence in his abilities. This experience should help that Pat build his confidence, and maybe next time you can split the presentation. I wish you success.



What to Do About a Poor Speaker?

Q Documentation is a serious problem at our installation. At present we don't have a methodology or system for documentation. Several vendors of such packages have made presentations and we are considering the purchase of one of them. How long would you anticipate it would take to implement a commercial methodology.

A Hard to say; however, it is a good question. I will accumulate and print the results if *Computerworld* readers who are users of Pride, SDM/70, Spectrum, etc. will send me a card stating elapsed time to implementation, man-months devoted to implementation and the number of professional DP personnel at the site.

Q I will graduate this year as an electrical engineer. After spending last summer working in a DP center, however, I have decided to pursue a career as a programmer/analyst. In fact, the company where I worked has invited me to interview for a permanent position.

Several things troubled me about this particular company, however. Last summer I did exactly the same work as people who were hired as long as two years ago. The analysts and programmers have been with the company either a short period of time, say one or two years, or ten or more years, with very few in between.

I also noticed the company has absolutely no training program. All training is essentially on-the-job.

Am I being overly concerned?

A Having no intermediate-term employees is a definite indication that the young people are leaving early. As is often the case, the older employees and their families have established roots and have rationalized that it is probably better to stay than to pick up and leave. This scenario is more common than one might think.

However, since you enjoyed your work last summer, I would take the interview and with it the opportunity to have a frank talk with your colleagues of a summer ago.

Sometimes an interview is limited to management and recruiting personnel, thereby giving the interviewee an artificial picture of the real working environment. Be sure to indicate to the people scheduling your interview that you wish to talk to some of your old colleagues.

Ask them about turnover, career path development and staff morale. Address the same questions to recruiting and management personnel, then compare notes. There should be a one-to-one correlation between the way management says it is and the way it is.

Q Of all of the pressing problems and issues in DP, both present and future, which one do you feel to be the most critical?

A I would like to turn this question around and ask *CW* readers what they feel to be the most critical DP issues and problems.

Drop me a note with your job title only and list which three of the follow-

ing issues and problems you feel are the most pressing: DP auditing, privacy, certification, personnel retention, standards and procedures, continuing education, security, DP management, user interaction, rapid increase in technology, internal image, documentation and the ever-popular "other."

I'll compile and print the results.

ments planned for the foreseeable future. However, the fact remains that I still have a job to do and can't speak for 30 seconds without a hostile interruption. How would you handle the situation?

A Contact your supervisor to determine if a formal vehicle exists to document these complaints and

'Turnaround Time' is a new reader service column that will appear regularly in *Computerworld*. All kinds of questions are invited, but readers are urged to keep them as concise as possible. Send them to Larry Long, Editorial Department, *Computerworld*, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

Q My job is to provide user training for an on-line accounting system that has more than 250 terminals at numerous sites throughout the plant. Most of the training sessions are composed primarily of clerical personnel; some training sessions include firstline management.

I am constantly getting barraged by complaints about how the system "doesn't do this," it "shouldn't do that" or "here is a better way." People are really fed up and since I'm available, they vent their frustrations on me.

Their complaints are not without merit — the system really does stink and there are no changes or enhance-

ideas. Don't step too far out of your job function, but no one would be harmed if you and your supervisor made an informal inquiry as to the last system evaluation (my guess is it was the postimplementation evaluation, if any).

If the system has been operational for more than one year without an evaluation, encourage the appropriate DP personnel to initiate such a review. Hopefully, you will be able to tell your users of an upcoming system evaluation with the prospect of some positive enhancements based on their recommendations. Let me know what happens.

Long is a professor at Lehigh University, a DP consultant and author.

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EDITORIAL

Voter Manipulation?

The pervasive use of computerized mailing lists, demographic data and word processing technology in political campaigns raises some timely questions regarding the potential for manipulating voters.

Although the use of such technology in the 1980 presidential campaign does not quite approach the kind of Big Brother control that social observers have long feared, the selective presentation of information can and does affect the voting habits of the populace.

A good example of the effectiveness of such pinpointing techniques can be seen in the relative successes of the campaign strategies of Republican candidates John Connally and George Bush.

George Bush launched a relatively small but expert direct mail campaign aimed at drumming up political support from those most likely to respond favorably, based on economic, educational and geographic characteristics [CW, Jan. 28].

Connally, on the other hand, who remains far ahead of the other candidates in the amount of money raised, has spent much of it on nonselective advertising methods such as television and radio spots, which reach a wide audience but actually "hit" only a small percentage of listeners [CW, Feb. 4].

The surprising results of the Iowa caucus last month highlight the potential benefits of such targeting methods: Bush led the Republican pack with 32.8% of the vote while Connally lagged with a mere 9.7%.

Bush's success cannot be attributed entirely to his direct mail efforts, of course, but neither can such an effort be discounted in analyzing the reasons for his success.

And while candidates have tried to sway voters with selective campaigning for over 100 years — through interest group membership lists and "working the Irish wards" — never before has the technique reached so many people with such an accurate assessment of their predispositions.

In a society accustomed to electronic information-gathering, the question remains whether "persuadable" voters are getting "the truth, the whole truth and nothing but the truth."

DATA PAST

Five Years Ago Feb. 12, 1975

ARMONK, N.Y. — IBM prepared to act on its leasing deals. The firm offered long-term leasing customers only limited one-year rate protection on its line of 370 virtual machines. IBM said it reserved the right to raise rental prices under such four-year contracts by 5% after the first year, another 5% after the second year and a further 5% the final year of the contract. IBM also promised "swift action" in collecting the penalty payments on long-term lease cancellations.

NEW YORK — The trial of the U.S. government's massive anti-trust suit against IBM was delayed by three to four weeks because of clerical problems in copying the extensive number of documents in the case. The problem, according to IBM lead attorney, Thomas Barr, was that the copying service used by the government "destroyed" the document sets so it was almost impossible to tell the order of pages.

Eight Years Ago Feb. 9, 1972

NEWTON, Mass. — A Computerworld survey of DP budgets of firms listed among the top 100 computer users in the country concluded that major computer users would continue or expand their cost-cutting measures learned during tight budgetary times even when purse strings began to loosen. Of those surveyed, 75% reported that their budgets would either remain the same or increase, in sharp contrast to the past two years when surveys showed decreasing DP expenditures. Despite budget increases, users were continuing measures to get "more bang for the buck."

ATLANTA — Univac reassured RCA users that it would fill outstanding orders for RCA equipment and all new orders received by June 30, 1972. And existing RCA sites would not be forgotten: maintenance would be handled by customer engineers who moved over to Univac from RCA or by Univac personnel.



LETTERS

'Untruthful Allegations'

"Stolen Keyboards Recovered" [CW, Feb. 4] presented a number of untruthful, unfair and unsupported allegations that reflect falsely upon Metroplex Computer Co., its president and its secretary-treasurer. I want Computerworld and its readers to be aware of facts that contradict the information in the story:

1. We have already undertaken civil litigation to solve any allegations or problems relating to the title of merchandise bought and sold by Metroplex Computer Co.
2. The company and the two officers mentioned in the story are innocent of the allegations and intend to establish their innocence in court.
3. Metroplex Computer Co. has a four-year record of stable growth and profitability and we will not allow its good record to be damaged by false and misleading accusations.
4. We will be exonerated from all claims and allegations and will continue to do business fairly, reputably and successfully.

Donald O. Norris
President

Metroplex Computer Co., Inc.
Dallas, Texas

IBM Reply

On Jan. 22, IBM demonstrated the System/38 to emphasize the product's capabilities and IBM's readiness to meet its new delivery dates.

From that, Computerworld inferred future conversion problems [CW, Jan. 28]. Then a CW editorial drew the conclusion that IBM was not sufficiently concerned about its customers [CW, Feb. 4].

Let me correct the erroneous impression those reports may have left with CW readers.

Brian Utley of IBM was misquoted in the initial article. He did not say that the file changes may be difficult because of a lack of RPG-II documentation. In fact, files do not have to be

changed, only copied.

He did not say users converting from a batch-oriented System/3 to an interactive System/38 are likely candidates for problems. In fact, batch programs cannot be "converted" to interactive.

As for the editorial, you should know that IBM is very concerned with its customers and the conversion process. In fact, advanced aids offered with System/38 were designed for just that purpose.

I know of nothing within the System/38 program — including our decision to defer deliveries to assure the finest possible performance — that is not dedicated to support IBM's commitment to its customers.

P.M. Foley
President

IBM General Systems Division
Atlanta, Ga.

DPMA Still Fighting Tax

As chairman of the Data Processing Management Association's (DPMA) Sales Tax Subcommittee, I would like to comment on "To Tax or Not to Tax: The Software Question" [CW, Jan. 28].

I also was involved in the panel discussion at the National Computer Conference last June and, like Bob Sherin, was distressed by the poor attendance. However, this has not diminished DPMA's continued involvement in and support for the industry's position of intangibility and nontaxable status.

DPMA has taken the approach that if one company in any state will come forward, we will provide the manpower, documentation and nonlegal expertise to address a specific assessment question.

This approach is working; millions of dollars are being saved in New York State alone every year.

I commend CW for its continued interest in and publicity of this effort.

Steve Vajda

Miami, Fla.

READER COMMENTARY/John A. Postley

Cooperative Approach Produces Best Contracts

The views of Paul J. Ostling on software contracts ("Contract Plays Suggested for Users" and "Beware of 'Mined' Contracts, Attorney Warns," CW, Jan. 28) are so out of touch with reality that they must be rebutted. It seems to me that his are the views of a lawyer seeking to win the case when (not if) it goes to court. As such, they serve the best interests of neither the user nor the vendor.

By attempting to pressure the vendor "to devise a system appropriate for the applications at hand," the user abandons his proper role. It is the user who knows (or should know) more about his needs than the vendor. The user should indeed "specify what the system should do," but he should then work with the vendor in deciding how to do it; otherwise the communications gap may be too great for either to overcome.

Detailed accounting by the vendor sounds like a good idea, and sometimes it is. But if the user intends to hold the vendor responsible for meeting operational schedules and budgets and to penalize him if he fails to do so, then the user must provide firm specifications at the outset and not change them.

And he must accept the fact that the vendor's proposal will include a contingency factor, since he cannot know the solution to every problem he will encounter before he begins. I have met very few users who will or can provide firm specs and equally few who understand the role of a contingency factor

in the budget.

A "time is of the essence" phrase in the contract is not a bad notion, but it too must be properly handled. First, the parties must agree that time really is of the essence; if not, then the imposition of time constraints could be detrimental to the final system (sometimes it takes longer to do it right). On the other hand, a performance bond is fine as long as the user pays for it and as long as "performance" is meaningfully defined.

Essentially, if the user wants the vendor to accept liability for any kind of system failure, and especially for consequential damages, he must recognize that the vendor will (at least should) include in the contract an amount representing the probability that damages actually will be assessed. And the contract must also include the means to determine whether the failure was actually attributable to the vendor or to the user himself (in which case the user might have caused damages to the vendor's reputation). It is not unknown that suits are instituted and even won by the wrong parties once in a while.

What kind of a statement is "if you're (the user) happy with your system, you've probably been oversold"? This whole process works best, and sometimes only, if it is approached as a cooperative effort and not a competition, legal or otherwise. Most of the time, a request for proposal (RFP) approach to selecting a vendor for a customer (Continued on Page 29)

READER COMMENTARY

Robert J. Sherin

Mass. DPers Now Have Avenue of Tax Relief

Massachusetts DPers, who have continued to pay software taxes while the Department of Revenue enters its second year of deliberation on DP tax rule-making (CW, Oct. 15), now have an avenue of relief.

There is strong support within the department — at least for the present — for asking, through formal abatements, that software assessments under the Massachusetts sales tax be nullified. The law is now unevenly applied, with some companies being taxed and others exempted for essentially the same transaction.

Such filings for abatements in Massachusetts can go far in showing solid opposition to the tax, which seems to be a prerequisite to gaining a rightful exemption.

It is noteworthy that the Tax Commission itself has emphasized it will only draft regulations after meeting with the industry in a formal hearing on proposed regulations to be derived from evidence already presented by the industry and from other states' rules.

Filings for abatement would be an appropriate response to the wise warning issued almost three years ago by Roy Freed, a Boston attorney well known in DP circles: "Instead of sitting around for years — ostensibly waiting for the sales tax collectors to promulgate regulations but actually hoping their existence would be overlooked — [DPers] should have been taking the initiative to influence the adoption of a proper approach."

"They should have been on the of-

fensive all along," Freed contended then. Since Freed's comment, little has changed. Sure, organizations like the Association of Data Processing Service Organizations (Adapso) and the Data Processing Management Association (DPMA) took the cue and are at work in opposition, but their biggest problem is getting grass roots support.

As a perfect example, California has collected millions of dollars in software taxes under dubious authority since the early 1970s, yet most DPers there quietly accept the status quo and pay without a whimper.

And what could be more susceptible to arbitrary interpretation than California's onerous Rule 1502, which taxes software but exempts programmers, analysts and technical help?

The software tax is, after all, a tax on the labors of an industry. How broad or how narrow that tax is — and it could be considerable — depends on the authorities' conceptualization of our activities. Are we manufacturing or are we providing a service? And what precisely is software, anyway?

Between state rule-makers who don't know what software is and auditors anxious to post new taxes, the software tax is being pushed forward.

It seems strange that the people best able to shed light on the subject — DPers themselves — have been acquiescent all too often. Massachusetts DPers should seize this opportunity to shape their own futures.

Sherin is president of Nova Computing Services, Inc. in Miami and a non-judicial legislative advisor for DPMA.

READER COMMENTARY/Don McNeil

The Myth of Software Maintenance

It is said to cost a lot, to consume an inordinate amount of time and to produce unsatisfactory results. It is scorned by management and dreaded by technical staffs. But it is fashionable to babble on and on about it. And everybody's doing it.

The current fad is to call it "maintenance." Now if you believe the myth that software is subject to maintenance, read no further. You probably also believe that programs contain "bugs" (which walk in on their own six legs), that there is a technological panacea for every DP problem and that software production ought to be an artsy-craftsy, touchy-feely, guru-centered occupation.

Everyone is entitled to cherish beliefs, especially regarding harmless myths such as the tooth fairy. Where software is concerned, however, thoughtless acceptance of popular mythology can be costly or dangerous or both. Since some of the worst problems in the DP industry are already managerial in nature, it is especially important that management not buy or propagate additional illusions.

The software "maintenance" myth has not been dispelled by the otherwise healthy trend toward appreciating software architecture and construction

as engineering disciplines. Software and hardware may have analogous development methodologies, but there is at least one crucial difference in their end products: *Software does not deteriorate, so it is not subject to maintenance.*

To "maintain" is to "preserve in an existing state." Most software never was any good and hasn't been improved by alteration, so in a sense it can be said to have been maintained, that is, kept awful. If improvement is intended, it might be wise to embark upon evolutionary redevelopment rather than maintenance.

The word "maintenance" is most commonly misused to refer to all of the modifications made to a software system after initial development. You can call it "enhancement" or you can call it "repair" or you can call it "maintenance," but if you proceed to establish a "Maintenance Department," staff it with new hires and dump responsibility for patching production software there, you have been misled by your terminology. The attitude that all post-installation modification is technological janitor work keeps everyone's nose in the dirt. It also produces rotten software.

The notion of maintenance is, of

course, relevant to some DP activities. Hardware gets dirty, deteriorates and breaks down, so hardware maintenance is necessary. Data bases, too, are subject to contamination, damage and structural disintegration and must therefore be maintained. Data base and data space maintenance is essential work, but nowadays it can be performed perfectly well by trained professionals using preestablished procedures.

Apart from these legitimate areas of maintenance, there are the rare cases in which software has been stabilized and is no longer evolving. The programmers who respond to the occasional emergencies which cannot be handled by standard procedures might be said to do "support" or even "maintenance," though the title "production programmer" is more appropriate.

Typical software systems have defects and must be adapted to meet new requirements. They need even more competent care than systems being put together for the first time. Every change to production software must, if it is to be done properly, go through every phase of the software development cycle: *investigation* of the current situation, *specification* of the functional changes needed to serve

current or anticipated purposes, *design* of the structural changes that will perform the specified functions, *construction* of the designed changes, *certification* that the changes do everything intended (and nothing unintended), *installation* of the changed software and *evaluation* of the changed system in operation.

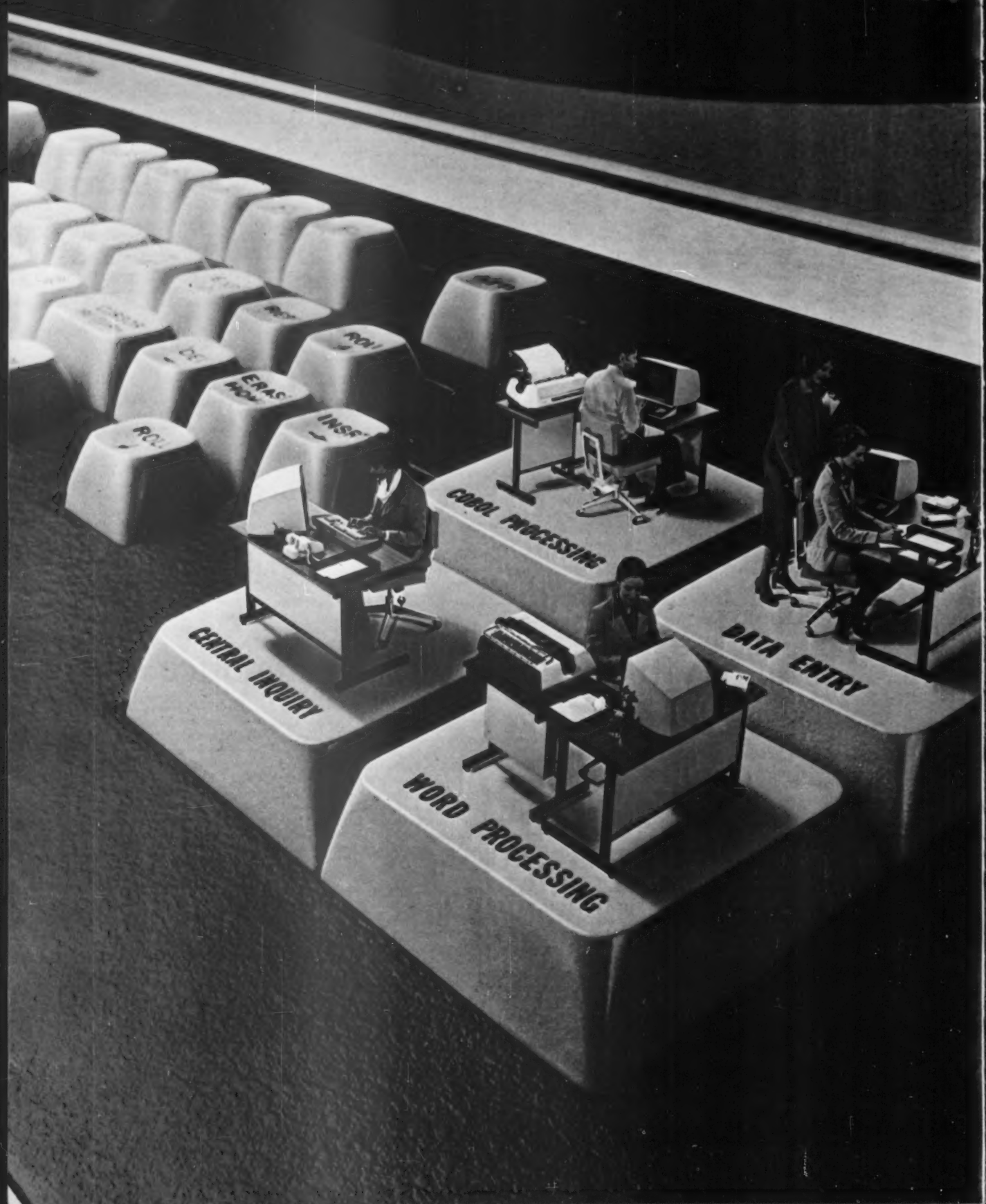
And every phase must be planned, documented, checked and communicated to those who need to know. To do less is sloppy.

We can say all this glibly; to do these things is more difficult. An article called "Adopting a System Release Discipline" (*Datamation*, January 1979) reported on how one DP shop was able to organize itself to bring the evolutionary redevelopment of software under control, but each shop should expect to have to design its own methodology for orderly adaptation of software.

There is no single guaranteed formula for success. You are on the right track, however, if every software change you make is thoroughly designed before construction and carefully checked afterward. And, of course, there is no substitute for competent, well-trained staff doing the

(Continued on Page 29)

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HUMAN CONNECTION/Jack Stone

MIS Should Embrace Office, Voice Systems

Along with the changes in the role of the DP department discussed earlier in this series, it appears timely to phase over to the department, in an orderly and controlled manner, the responsibility for all business information technologies. These include "nondata" products for such applications as word processing, voice communications, micrograph-

ics and photocomposition — and whatever else will be announced by the time this article is published.

This shift is appropriate for several reasons. First, in the broadest perspective, these newly emerging systems must be considered components of the total management information system (MIS) network for the enterprise. It no longer

makes sense that data, communications, office and related systems be selected independently; they have communications tie-ins as well as overlapping functions. A clear example of this is the "universal workstation," an all-purpose terminal now being touted by the business systems vendors that provides access to and control of multi-

function systems.

Second, the dollar levels associated with purchases of these nondata business systems by the larger organizations are often very large, in certain cases approaching the hardware costs of the central computer facility. I dare say that, for example, every typing "pool" is a candidate for refurbishment with word pro-

cessing gear, and there are an awful lot of typists around.

In addition, an enormous variety of systems is available — functions, features, shapes and styles — which suggests that much can be gained through some proper scientific investigation of alternate systems prior to plunging down a check. Yet, the well-established functions of a user needs evaluation, feasibility study, systems analysis and systems design for applications other than data systems are rarely performed (except, of course, by the salesperson on the account). I dread to estimate just how much extra hardware of the nondata variety is already floating around business and government establishments.

Just Another Challenge

DPers are the only ones around who can attack this class of systems problem reasonably successfully. After all, in a general sense, it represents just another set of information system development challenges. Although our record of success with very complex data systems is somewhat mixed, I think there is widespread agreement that we have done a crackerjack job on less complicated ones and nondata-type systems fall into the latter category — at least for now.

Another reason for considering the integration of business systems responsibilities derives from the internal competition that has grown up in many organizations with respect to controlling electronic business systems. In many organizations, responsibilities for data, voice communications and office systems are generally split among three departments, each of which vies tooth and nail for every resource scrap it can dredge out of the corporate coffers. It's difficult to find anyone in the executive lounge who recognizes that resources for the three functions can be traded off against one another to achieve some sort of optimum information systems capability over time.

Centralizing the information system responsibilities will also encourage a needed change of management attitude toward the nondata systems. Prior to the onslaught of micro- and mini-based technologies, the acquisition of office and communications systems was based on cost considerations alone, which was probably OK because the systems had relatively limited capabilities and features. But these days, such systems should be evaluated on cost/benefit bases and support cap-

(Continued on Page 29)

"Because we compete on the basis of service, the Fastrain Printer was the better business decision."



Carlson Marketing and Motivation (CMM) is one of the world's largest premium/incentive organizations. Comprising some six operating companies and providing a very diverse range of services, CMM requires exceptional computer resources. E. C. "Skip" Gage, president and Ed Frandle, director of operations, discuss some of these requirements.

Gage: "We're totally service-oriented, and in the last few years our growth has been almost explosive. Obviously, data processing is a very important part of our delivery system."

Frandle: "Right now we have ten different data centers to serve our clients. We need not only the capacity to handle the volume, but also the flexibility to handle the complexity of our operations. That's why we chose Control Data's 32111 Fastrain printer—it gives us almost twice the throughput of a 1403 and yet it's completely compatible with our hardware and software. The Fastrain even accepts our existing carriage control tapes, so conversion is transparent and painless."

Gage: "We were also impressed by its print quality and reliability. Both were exceptional, given that it operates at 2000 lines per minute."

Frandle: "That's right. In one three-month period, it cranked out more than 60 million lines with perhaps one hour of downtime. I think that's pretty good reliability."

Gage: "We're getting almost twice the speed and print quality that's as good if not better. We're getting service and support whenever we need it. We're getting greater ease of operation and greater ease of conversion. For us, the Fastrain was the better business decision."

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Foggy View of the Issue

C.N. Winningstad's Reader Commentary, "Laying the Blame In Mid-Air Near-Misses" [CW, Jan. 28] merely added more fog to the cloudy air traffic control issue.

The analogy he drew between backup instruments available to the pilot and the broadband radar that backs up the air traffic controller's computerized primary radar is not appropriate. The pilot's backup instruments are immediately available only inches away from the primaries. The conscientious instrument pilot includes all instruments in his normal scan of the panel, so the transition to "partial panel" does not require extensive mental re-orientation.

Not so with the controller. As pointed out in "Controllers Cited in

Near-Miss" [CW, Dec. 17], a 400-pound backup radar scope must be physically swung down to a horizontal position. Plastic or paper aircraft identifiers must be manually made up and pushed around on the scope. Yet the controller is expected to handle the same traffic load he had on the tidy, computer-generated depiction that included alphanumeric tags with altitude and even airspeed.

Unlike the pilot's instant transition to "partial panel," the controller's transition to backup takes time (up to several minutes) while a dozen aircraft may have moved several miles. The controller must not only catch up to

the new "picture," but must do so with very different inputs. For example, in "backup" mode, altitude data is collected by manual polling via voice radio!

Both the pilot and the controller are essential to safe all-weather air commerce, but comparisons between the two functions are dangerous when they discourage efforts to replace obviously outdated hardware that passengers' lives depend upon.

Let's not point accusing fingers or compare pilot and controller salaries, but get on with replacing antiquated air traffic control equipment. Using

today's low-cost minicomputers, we could install a reliable primary and a redundant backup at every Air Route Traffic Control Center for less than the lawyers' fees from one major mid-air.

Alexander B. Trevor
Columbus, Ohio

An Inevitable Task

Thank you for publishing my views on a "computerized" approach to fuel allocation. Judging from the headlines and excerpts used, it would appear that the concepts outlined struck a responsive chord. One reader's reply you published probably hit the nail on the head when he wryly cited reasons the system wouldn't be acceptable.

There is also one additional problem in evidence, a great lack of interest. I don't know how many responses you received, but I didn't get any directly. Apparently apathy will reign and we will soon be burdened by a costly and inefficient coupon system.

At least we tried to expose some potentials for handling an inevitable task in a better way.

Herbert E. Martenson
Columbia, S.C.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

The Software Maintenance Myth

(Continued from Page 25)

work.

Perhaps, after all, the engineering of quality software is inevitably expensive and time-consuming, but it need not be the source of as much dissatisfaction as it is now. If we choose to do so, we can initiate changes that will put us in a world where:

- Unsatisfactory software is supplanted, either by evolutionary or revolutionary redevelopment. (Compre-

hensive respecification and redesign are usually needed in either case.)

- All software is fully documented to modern standards (retrospectively if necessary).
- Interfaces, not job descriptions, are standardized.
- Software components, not people, are made interchangeable.
- Staff efficiency is measured in terms of the number of lines of zero-defect code managed in production,

not in terms of the number of lines of new code written.

- Staff effectiveness is judged by the users' view of software product or service quality.
- The best staff is committed to making production software as good as it can be and keeping it that way, no matter how much change takes place.

If that world appeals to you, you can shake up the establishment and make it happen. But whatever you do, don't do "maintenance" unless you really want to keep your software the way it is.

McNeil is an information systems consultant based in Bridgeport, Pa.

Contracts Can Work

(Continued from Page 25)

tom job is not the best approach in either the private or the public sector. In my experience, users rarely know how to write RFPs and even more rarely know how to evaluate "competitive" bids when they are received.

And finally, how can Ostling expect a vendor to adapt to changed user needs (which may actually include misstatements of the alleged "needs" in the first place) without renegotiating the contract?

It has been my experience that vendors and users alike will try to include improper clauses in software contracts. Sometimes such clauses attempt to take advantage of the other party and sometimes they are just boiler plate

that one party (usually the user) wants to include because it is a contractual "standard" of his organization (even though it may have nothing to do with software).

May I suggest that the simplest and most effective procedure of all might be the following: If you don't trust the other party, don't sign a contract with him; if you do trust the other party, try to develop a contract that is as fair to both parties as you can make it. In the final analysis, any contract is worth only what the parties want it to be worth. If both parties truly want the contract to work, it will.

Postley is a Los Angeles-based consultant in domestic and international business strategy.

MIS Scope Expanding

(Continued from Page 25)

ital investments whose return may be spread over a period of years. This perspective also helps to justify one-time charges for analysis, development, installation, training, documentation and so forth.

Some Reservations

However, let the record here state that 1) I am not in favor of any increased responsibilities for the DP group unless top management comes across with the resource goods to discharge these changes: namely, the transfer of people, budget, space and whatever else is associated with the switch, plus more budget for additional resources as may be necessary to accomplish the expanded mission in an acceptable manner; and further, 2) I do not support any change until the current DP operation has its full complement of resources and is under control.

I recognize that a lot of DPers feel that the systems burdens they are cur-

rently carrying are enough and they choose not to add any more. But my answer is that there is only one information systems network and there should be only one information systems department to develop and operate that network.



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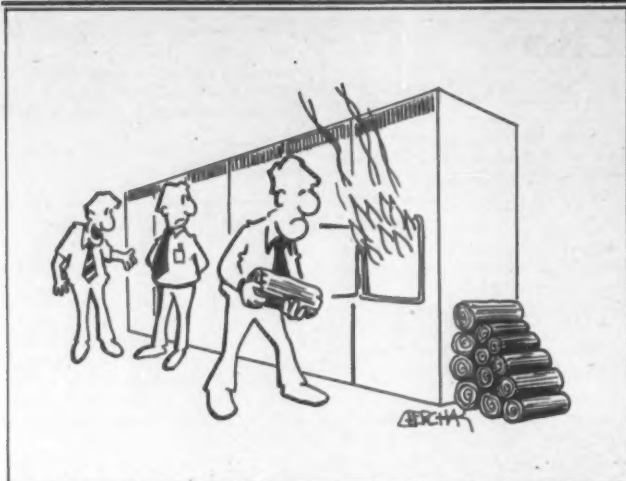
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THE TAYLOR REPORT/Alan Taylor

Datapro Results Raise Verification Questions

The publication of some 9,537 individual product ratings by Datapro Research Corp. last month was accompanied by the great annual hoopla over the so-called Honor Roll of 44 of the 335 products reported on, as usual.

This year it was also accompanied by derogatory comments about product manufacturers, both those who have cooperated with Datapro and those who apparently have not, and users should be very careful before using these thousands of numeric ratings whose basis has not been verified.

The vendors who have apparently not cooperated (by not providing fig-

ures as to how many of their products are in use) find the absence of such data is completely attributed to their failure to get the figures to Datapro. No mention is made of any possible failure on Datapro's part to actively seek the figures or cooperate with the vendor in other ways.

The vendors who have provided information find it singled out in the notes as "completely (sic) unverified," and the survey user is warned at least 10 times about the particular danger of believing such unverified material.

However, Datapro does not indicate what type of verification was offered or attempted, nor does it indicate how the much more numerous figures produced by the Datapro staff (which are published without any such caveats) were verified before publication.

Derivation of Ratings

A Datapro rating is based upon a small, uncontrolled sample of responses to a largely ignored survey that isn't even addressed to product users. (It goes to some recipients of a free publication.)

These responses are then mathematically massaged within Datapro and published without verification of any intrinsic accuracy. The numbers are intended to "pinpoint the . . . weaknesses of competing products," the publishers say.

Verification of the numbers' accuracy to match such advertised claims would entail, at the very least, a check of the accuracy of the returns against a group of known users as well as an independent check on the mailing and returns received. It would also involve checking out the comparative accuracy of, for instance, the "use of excessive resources" in Datacom/DB (a product the survey found universally "excellent") vs. the same ratings in the competitive products.

Datapro publishes, and profits from, the material for this use without attempting verifications and seems to use the producers of the packages as a screen to hide this.

One Example

For example, in the survey, Datacom/DB producer Applied Data Research, Inc. is shown as one of the firms that did not supply the requested information about the size of the user base. A phone call to an 800 number got me the information immediately (about 200).

But I also learned that Datapro had substantial reason to believe that prior ratings of this product were inaccurate as published. No hint of this reached Datapro readers through Datapro, nor did any indication as to the storm of protest from other industry sources that the former ratings had produced.

Cooperation is a two-way street. If Datapro is unwilling to cooperate, it has no right to expect cooperation or to claim that the published ratings are any more accurate than they have been verified to be, given mutual cooperation.

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As In-House Development Slackens

Report: Prepare DP Staff for Packages

By Marcy Rosenberg

CW Staff

PENNSAUKEN, N.J. — A shift from developing programs in-house to acquiring software from outside suppliers can spell long-term labor cost savings to a user organization, but may leave its technical DP personnel quivering about their job security.

So unless psychological issues related to software procurement are addressed, high employee turnover will persist as technical personnel continue to buck the trend to purchased software, viewing it as an unfavorable reflection on their abilities.

In citing this problem, Auerbach Publishers, Inc. in a recent report also suggested some strategies for preparing DP personnel for software acquisitions. Among them:

- Explain the anticipated impact of planned procurements on the roles of the

DP staff.

- Train personnel for software evaluation.
- Plan for the transition from procurement to installation.

Shift in Responsibility

As more user organizations turn outside for systems and applications software needs, the role of in-house DP personnel will shift away from program development to more responsibility for procuring, installing and administering externally developed packages, the report said.

To ready staffers for this changing role, corporate management should directly communicate its future software acquisition plans to DP employees early in the game, the report advised.

However, lack of communication about DP planning is more often the case. The re-

port outlined several reasons for this: management fears its DP strategies will leak to competition; the overhead associated with disseminating information to a large staff is great; and the plans themselves may be tentative and subject to change or cancellation.

Any of these factors could justify a closed-mouth stance in some cases, especially when the goal of a package procurement is to trim the number of in-house staffers. But as the report pointed out, very few software procurements lead to a net reduction in staff and when they do, the cuts can often come through attrition at a not unreasonable cost.

Despite the negatives, early communication of software plans has its advantages and should not be overlooked. Involving the technical DP staff at the ground floor of procurement planning serves, if nothing else, a psychological need. "It is easier for the technician to tune out extra information than it is for him to deal with the frustration of knowing too little," the report explained.

To what degree should technical personnel be involved in acquisition plans? According to the report, these employees should be told why management is considering a software procurement, when the software will be acquired and what their responsibility in the procurement process will be.

The report also stressed that management should take steps to assure staffers that their skills will be needed even after the product is installed.

Before the technical staff can effectively participate in the evaluation effort, how-

(Continued on Page 32)

Cullinane Updates IDD

WELLESLEY, Mass. — Release 2.0 of the Integrated Data Dictionary (IDD) combines user identification with password security and allows users to customize the syntax by adding unlimited key words, according to its vendor, Cullinane Corp.

The release, which runs on IBM 360, 370, 30 series and 4300 systems, requires 60K bytes of resident memory — twice as much as IDD Release 1.2, introduced about two years ago. Security functions in Release 1.2 were limited to user identification only, a spokeswoman noted.

By providing two levels of security, Release 2.0 reportedly prevents unauthorized updates of memory maps, programs, records of file modules. These entities can be tailored by the user to contain any number of key words, Cullinane said. The earlier version of IDD had a fixed-form length and could be used only with dictionary and system entity definitions.

Cullinane claimed Release 2.0 offers added flexibility by permitting each element to be defined with up to five data formats plus definitions of communications entities such as terminals, lines and destinations. These entities are available for documentation purposes to any teleprocessing monitor, the spokeswoman said.

With Release 2.0, users can enter record definitions in Cobol record format without needing to define every element. The text-editing facility was also extended to allow manipulations of comments and module source code on a line-by-line basis.

By comparison, text editing in Release 1.2 limited users to adding or deleting comments and module source code, the spokeswoman

explained.

IDD 2.0 operates under the MVT, MFT, SVS, MVS, VS1, VS2, DOS/VS, DOS/VSE and VM/CMS operating systems. It can function as a stand-alone data resource manager or as part of Cullinane's data base management software family.

A one-time license fee for IDD 2.0 costs \$15,000. A 10% annual renewal fee covers new software releases, maintenance and documentation, Cullinane said from 20 William St., Wellesley, Mass. 02181.

Mathematica Eases Limits In Latest Release of Ramis II

PRINCETON, N.J. — Many of the limits on files and records in the Ramis II data base management system (DBMS) have been extended or removed by Mathematic Products Group, Inc. in Release 2.0.

For example, while the earlier release allowed a record to contain up to 256 fields and 1K byte, Release 2.0 expands those limits to 32,000 fields and 90K bytes, a spokesman said.

In addition, the maximum number of bytes per level was extended from 1K to 4K; the number of fields per level was increased to 32,767 from 127; the number of virtual levels per file was increased from 10 to 22; the number of concatenated data bases that can be handled expanded from 12 to 25; and the number of bytes per library file entry, formerly 1K, is now unlimited.

Ramis II Release 2.0 also provides a PRO-

FILE command that allows a set of user-defined values to be assigned to system parameters. The values can be automatically invoked when Ramis II is initiated and may be modified at any time by a single-word command, the vendor noted.

Release 2.0 also extends the network structure capability of the DBMS to let the system's report writer automatically relate non-Ramis II files with Ramis II files. This ability to use data from master files maintained in Ramis lends itself to applications where Ramis is used to generate new reports from systems developed prior to its installation, the spokesman noted.

Fixed work areas in memory have now been replaced by variable work areas that are acquired dynamically as the need arises. This permits Ramis II users to handle larger

(Continued on Page 32)

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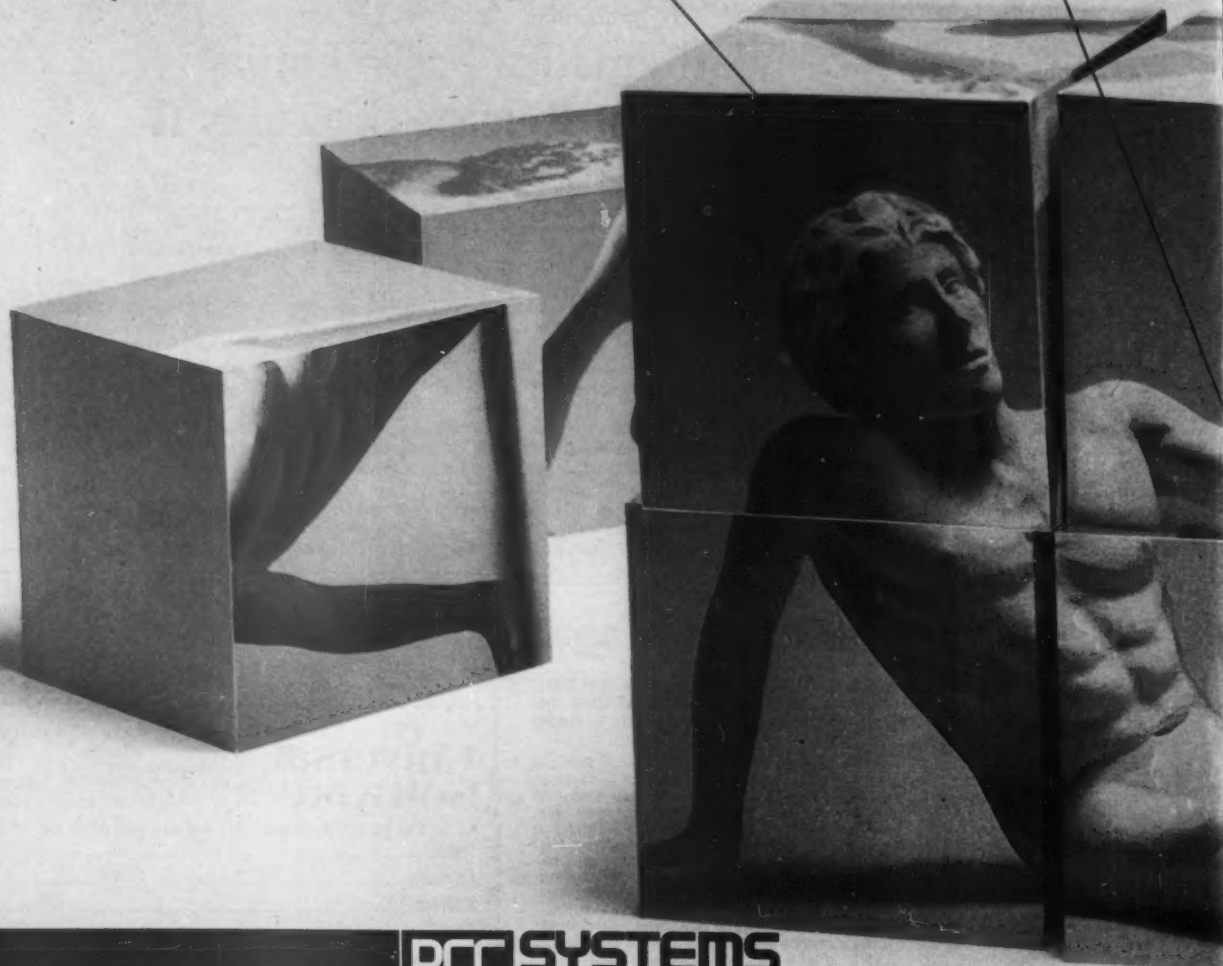
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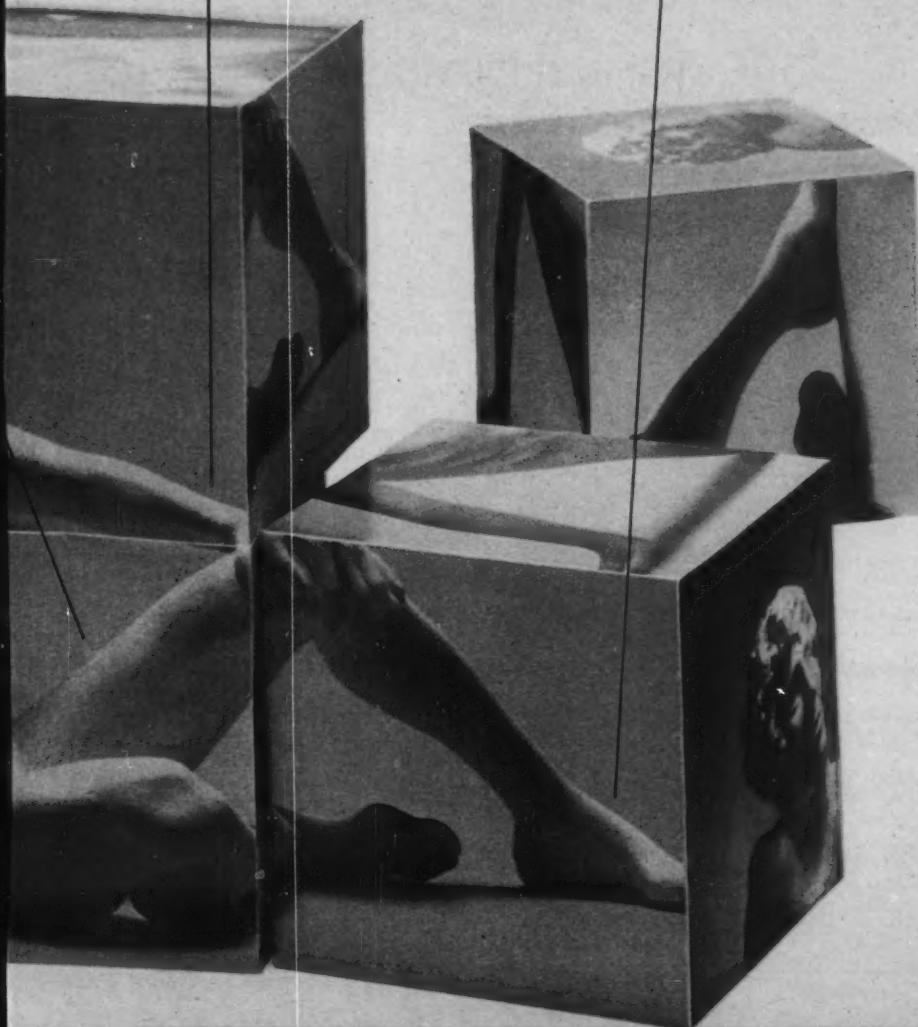
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Report Probes Psychological Effects of Packages

(Continued from Page 31)

ever, they will need to know not only the intended role of the software from a technical standpoint, but also how it will fit into long-range corporate plans, who will use it and what costs are involved.

Knowing cost and benefit trade-offs will often stimulate evaluation team members to consider aspects of package capabilities they may not other-

wise take into account, the report observed.

Along these lines, then, management should at least break out cost figures associated with the CPU, storage requirements, channel utilization and personnel salaries and overheads, the report recommended.

In addition, management should inform technical personnel of the extent to which the company can commit itself to a new package beyond initial license costs. For example, some firms will want to modify standard packages; those that don't or can't will more likely need an off-the-shelf package.

Technical Preparation

Before the evaluation process begins, staffers will of course need some technical preparation in either applications or systems software, the report noted. Beyond knowing the application area for which a package is sought, the evaluation team should also be counselled to avoid basing selections solely on the shortcomings of the existing system.

Since few university M.B.A. or graduate programs in information science expose students to a variety of application areas, the report suggested as alternative sources for technical training public seminars and literature advertised in trade publications or through direct mail solicitations by computer book clubs and private publishing houses.

In the systems software area, training

in not only the concepts but also the inner workings of such products is also a must, according to the report. And for these kinds of software products, representatives from a number of different applications programming groups within the user company should participate in the evaluation.

This suggestion is based on the fact that operating systems and utilities, data base management systems and teleprocessing monitors, though frequently selected by a systems programming group, are often transparent to applications programmers.

After narrowing the number of candidate packages, the extent and type of vendor training offered becomes important, both as a way the evaluation team can learn to define selection criteria and as a selection criterion itself. As the report pointed out, "If the evaluation team cannot learn from vendor courses on package use, how will other personnel in the organization gain this knowledge?"

Members of the Team

Given that an evaluation team's charter is defined and the steps for preparing to do an evaluation known, the next logical question is, who should make up the team?

The report recommended a mix of representatives from programming groups within the DP department. For example, one or more individuals familiar with the application and/or a systems programmer with sound background in package internals and al-

gorithmic considerations should participate.

Also, teams investigating packages that will not be transparent to all applications should include a representative from the user department in which the package will be installed.

Even after a package is selected, the technical evaluation team should continue to play a part in installation and maintenance. Because these staffers have gained considerable knowledge about the acquired software, they can be called on to help design package modifications and to train other programmers and user departments in its capabilities and use.

The report suggested that, in this support role, only one staffer serve as liaison with users and with the package vendor to establish good rapport with both parties. Developing a one-to-one relationship can also minimize unnecessary communication with the vendor.

Since the technical liaison is familiar with the installed software, he may spot "software problems" that result from user misuse and correct them without needing to involve the vendor unnecessarily, the report observed.

The report emphasized that involving in-house technical staffers early in the software procurement process also means giving these individuals some power to veto packages that fail to meet basic acceptance criteria.

Titled, "Preparing the Host Environment for Software Packages," the report is a supplement of Auerbach's Computer Programming Management volume that costs \$155 per year. The report can also be purchased separately for \$10. Auerbach is at 6560 N. Park Ave., Pennsauken, N.J. 08109.

Codasyl Asks For Comments

ARLINGTON, Va. — The Common Operating Systems Command Language (Coscl) Committee of Codasyl is seeking comments on its proposal for a standard time-sharing command/batch job control language.

The proposal is detailed in the latest version of the *Coscl Journal of Development*, available for \$6 from the Material Data Management Centre, Department of Supply & Services, Ottawa, Ont., Canada K1A0S5.

The committee also needs additional members. Anyone wishing to participate in committee activities or to offer comments on its work should contact the committee secretary, William LaPlant Jr., P.O. Box 2130, Arlington, Va. 22202.

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Ramis II DBMS Gets Updated

(Continued from Page 31)

files, the spokesman said, and minimizes the problem of underutilization of memory which often occurs when a fixed amount of core is allocated for jobs.

Multiple program control block support to the intelligent Ramis II interface with IBM's IMS is another feature added in Release 2.0. Previously, users could only access one block at a time, according to the spokesman.

Release 2.0 uses essentially no more memory than the earlier version, the spokesman claimed. A fully configured Ramis II DBMS running on an IBM 370/115 under DOS/VS, for example, uses a 65K- to 80K-byte partition; running under MVS on an IBM 3033MP, a typical Ramis II configuration requires 512K bytes of memory, he said.

For large CPUs — defined by the vendor as IBM 360/65s and larger, 370/155s and larger, all 30 series processors and 4341s — Ramis II Release 2.0 leases for \$1,120/mo including maintenance or can be purchased for \$43,000 to \$100,000, depending on options.

Smaller user installations — those that run IBM 360/50s or smaller 370/148s or smaller or 4331s — can lease Release 2.0 for \$575/mo including maintenance or can purchase the DBMS for \$22,000 to \$75,000.

Maintenance for purchased systems costs 10% of the purchase price after the first year, Mathematica said from Princeton Office Park, P.O. Box 2392, Princeton, N.J. 08540.

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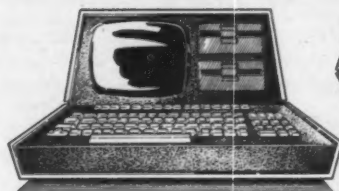
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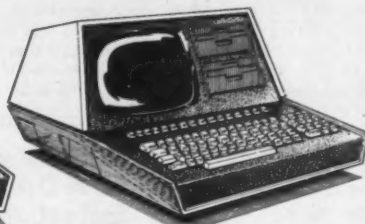
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Temple University Offers Double Benefit Finance Class Gets Hands-On Experience

By Richard Klein
Special to CW

PHILADELPHIA — Business degree holders with a working knowledge of computers are becoming more attractive to prospective employers. So when Temple University implemented a computer-based financial modeling system for teaching purposes, students gained a double benefit — a grounding in business finance and an opportunity to work with computers.

In October 1978, Temple University purchased the use of the Interactive Financial Planning System (IFPS) from Execucom Systems Corp. of Austin, Texas, with the help of funds from a Merrill Lynch Foundation grant.

According to the agreement

with Execucom, IFPS may be used for teaching support activities, university-funded research, university administration and executive development programs. It was able to secure the system at a substantially reduced cost because it would be used solely for academic purposes.

Used in Courses

Temple has a Control Data Corp. Cyber 174 with extensive time-sharing capabilities. Its computer center has operated and maintained IFPS without any significant problems.

Since the fall of 1978, it has used the system to teach computer-based financial modeling in several courses. In particular, it uses IFPS as

an integral part of one advanced undergraduate and two advanced graduate (M.B.A.) courses in business finance. This academic year, about 100 students are working on individual projects using IFPS.

Temple's experience with IFPS has been highly favorable. Its students find IFPS can be self-taught quite easily, and they are able to gain a substantial degree of self-sufficiency within a short period of time. Nevertheless, IFPS is a highly sophisticated system, and many part-time graduate students employed in the computer field have been impressed with the capabilities of IFPS.

Execucom has supplied Temple with updated and revised systems every six months. The firm's technical assistance and support facilities have been excellent, and their responses to the university's needs have been immediate.

I personally attended the advanced programming and the risk analysis courses given by Execucom in Austin. In addition, Execucom offered an informative one-day seminar last January for the business school faculty, here.

Student Orientation

My field is finance; most of my students have had only one computer course. In introducing IFPS to these students, I begin by discussing some of the concepts of financial modeling and two or three features of IFPS. I then require each student to study the *IFPS Tutorial* (a self-instruction manual), and to sit down at a computer terminal and duplicate the results of this manual. The purpose of this exercise is to overcome any fear of the terminal and to give the user a positive learning experience.

Each student chooses an individualized project in which IFPS will be the integral element. In lieu of a typical term paper, the student constructs a financial model, validates that model and demonstrates its usefulness. The project must include the construction of an IFPS model, the use of the report writer, the presentation of the results and a written analysis of the results. We believe this approach encourages creativity and self-reliance.

To help students select a project, examples of solved cases are on file in our library. To date, students have constructed financial models in such areas as budgets and projections, real estate investment analysis, mergers and acquisitions, capital budgeting, leveraged leases, profitability and projections of departments in nonprofit hospitals

and energy cost analysis.

IFPS has been a very useful tool in teaching business finance. For instance, the discussion of discounted cash-flow techniques in capital budgeting is facilitated by the availability of the IFPS built-in financial routines of Net Present Value and Internal Rate of Return.

Furthermore, my students can comprehend the concept of sensitivity analysis in capital budgeting when I refer to IFPS's "What If" capability: "If sales were down by 10%, what would happen to the return on investment?"

Monte Carlo Capabilities

The teaching of computer simulation for capital budgeting purposes is greatly enhanced by the "Monte Carlo" capabilities of IFPS. This feature permits hands-on experience and is an exciting learning tool. The ability to actively construct a financial simulation using triangular and normal probability distributions, for example, have provided students with new tools for the solution of problems of capital budgeting under risk and uncertainty.

Because of my emphasis on the ability to communicate information effectively to top management, my students have learned how to utilize the IFPS report writer. The formatting of reports is important, and this feature is quite easy to use. Recently, a number of completed projects have incorporated the use of the Plot (graphics) routine.

In essence, IFPS has furnished us with the ability

to integrate computer and information science in teaching finance.

Student Reaction

We have used IFPS with two groups of students, undergraduate and graduate (M.B.A.). Although many students have an initial fear of using computers as an integral part of a finance course, they soon get over this fear because of the English-like modeling language of IFPS. Students taking the finance courses involved are requested to purchase the user's manual.

Many students using IFPS have discussed the system in job interviews. Some have even included the ability to write computer-based financial models in their resumes. A few have commented that they were offered jobs in part because of their familiarity with IFPS.

In many cases, students have used IFPS in conjunction with other graduate courses, such as those in the areas of real estate, business policy and accounting. Once individuals become somewhat familiar with IFPS, they are self-motivated to use it in other contexts.

In the near future, I plan to introduce a graduate course in financial planning in which the IFPS project will be the central focus. The course will include elements of strategic planning and economic forecasting as well as financial modeling using IFPS.

Klein is an associate professor in the School of Business Administration at Temple University in Philadelphia.

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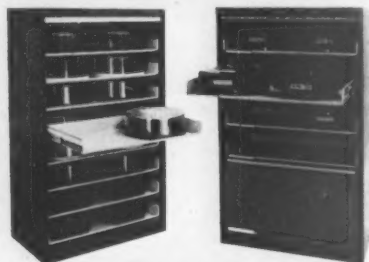
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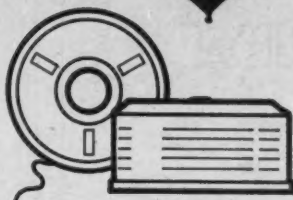
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Ansi Issues Catalog Of Current Standards

NEW YORK — The American National Standards Institute (Ansi) has issued its 1980 catalog listing about 10,000 current standards approved by the institute.

Standards contained in the 180-page publication cover dimensions, ratings, terminology symbols, test methods and performance and safety requirements for materials, equipment, components and products in information processing and other fields, Ansi said.

The 1980 catalog is divided into two major sections. One lists titles of Ansi-approved American National Standards alphabetically.

Designation, price, and applicable discount information are included with each title.

Subject Index

The second section compiles the designations of all standards listed in the subject section, referencing the subject heading under which the complete entry appears. It also gives price and applicable discount information, Ansi said.

Both sections indicate whether the standard is new to the 1980 edition.

The catalog is offered free to Ansi members and costs \$7.50 for non-members, Ansi said from 1430 Broadway, New York, N.Y. 10018.

Alternative to IBM's DL/1 Out for Commercial Sites

OMAHA, Neb. — A data base management system (DBMS) for IBM DOS, DOS/VS and DOS/VSE users is available from Consolidated Business Systems, Inc.

Called DA1, the package is said to be an alternative to IBM's DL/1. DA1 was designed for commercial installations and offers inverted, direct or sequential access to data structures for applications requiring random or indexed processing.

Sequential data structures are supported for disk, tape and unit record, Consolidated Business Systems said.

Data stored in inverted or direct structured may also be accessed sequentially. This allows users to re-

trieve large sections of data, the vendor noted.

DA1's options include multitasking support, multiple partition support and logging. Space used by deleted data is automatically recovered, according to the firm.

DA1's data definition language allows fields to be defined in a hierarchical manner. Data is independent from the field level, the vendor said.

Subsets of the data base definition can be selected to minimize overhead in specific applications, the company noted, adding that buffer sharing can also be used to minimize size.

The data manipulation language accepts a set of calls from a host language, such as Cobol. A reference manual is included to cut training time, according to the vendor.

DA1 takes up 12K bytes of main memory plus the user's buffer/table space. A perpetual license for DA1 costs \$34,850. A perpetual license for the utility programs costs.

The package can be leased for \$492.50/mo and the utility package for \$96.60/mo, Consolidated Business Systems said from P.O. Box 6183, Omaha, Neb. 68106.

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PDP-11 Gains NC Plot Package

DALLAS — A plotting program for University Computing Co.'s (UCC) UCC-APT numerical control (NC) processor is available for Digital Equipment Corp. PDP-11 users.

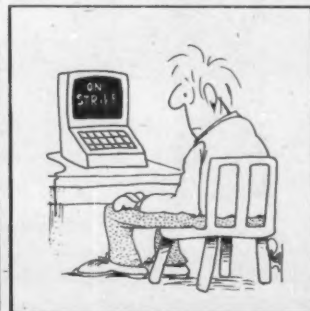
Called UCC-NC-PLOT II, UCC's program will generate and display a graphic representation of the cutter path to help the programmer verify the accuracy of a part program, the vendor said.

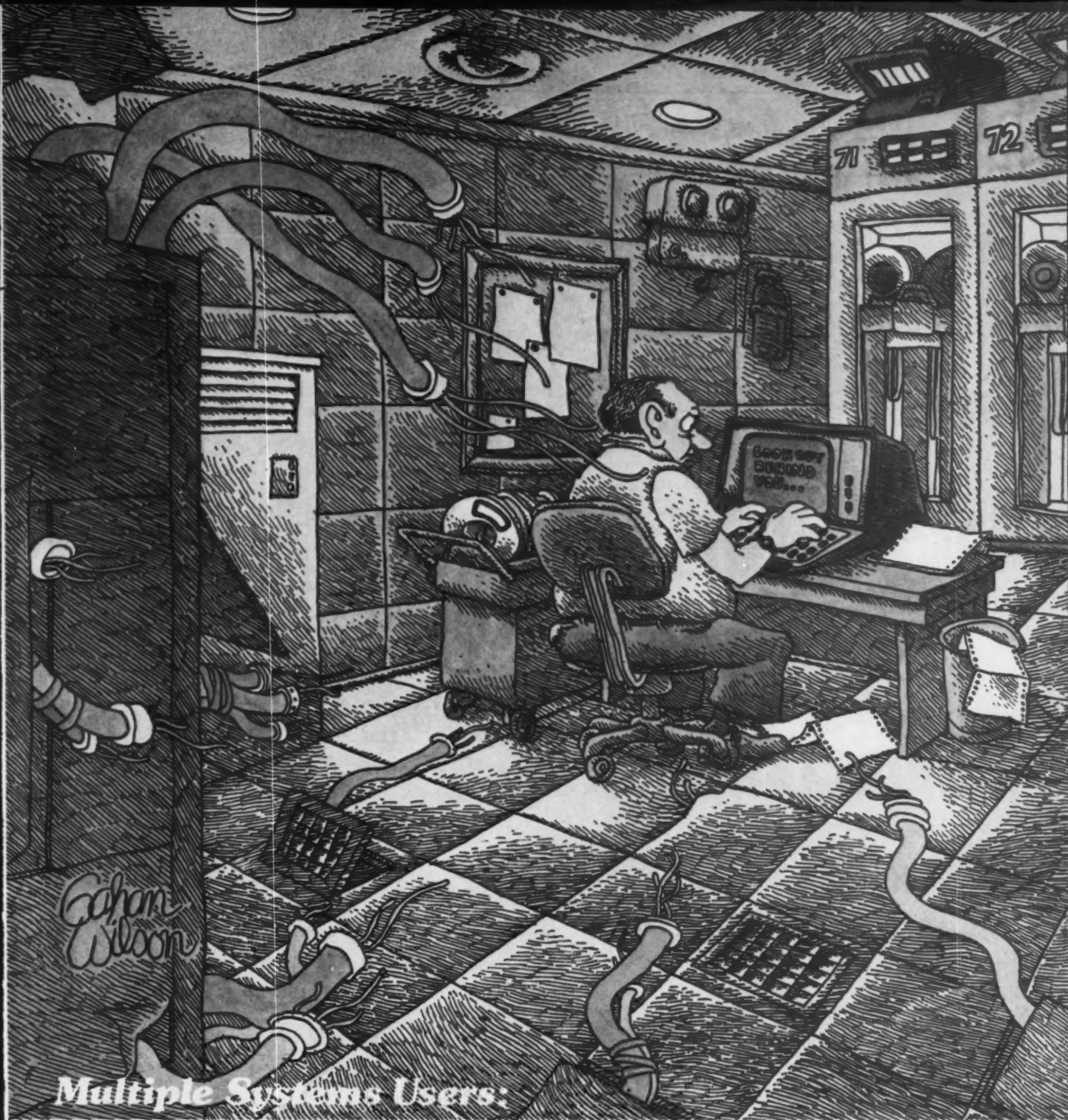
The plotting program is a UCC-APT postprocessor designed to generate a graphics data file to be displayed using the appropriate graphics display utility and on-line plotter. This graphics file contains the tool position data with default scale factors and the user defined frames.

The file can be plotted interactively with the utility routine, according to UCC.

The interactive option allows the user to change the view, scale factor and window selection of a plot to verify machining of the part, as well as alter translation and rotation.

The program costs \$3,500 and requires a minimum of 25K words of memory on the PDP-11, UCC said from UCC Tower, Exchange Park, Dallas, Texas 75235.





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HP 1000 Gains Pascal

PALO ALTO, Calif. — Hewlett-Packard Co. has released a version of Pascal for the HP 1000 series of minicomputers.

The Pascal/1000 compiler runs only in the multiuser environment on HP's RTE-IVB operating system and only on the HP 1000. Instruction sets are compatible across all HP 1000 models, so Pascal/1000 will execute on any HP 1000, the vendor said.

The firm recommended, however, a minimum of 284K bytes of main memory for compilation. HP claimed its version of Pascal adheres to the original version of the language designed by Nicklaus Wirth. In addition, HP is working with the American National Standards Institute (Ansi) to make sure HP's Pascal adheres to Ansi Pascal standards, now under develop-

ment.

Pascal/1000 is the only version of Pascal that HP offers. Although it will execute on any HP 1000, the language may not be for everyone. A spokesman said the Pascal compiler is a large amount of code similar to HP's Basic compiler or Control Data Corp.'s Pascal compiler.

Basic, Fortran IV and SPL, an HP assembly language, are also available on the RTE-IVB operating system, according to HP.

Pascal/1000 will link with other HP proprietary software such as Image/1000, Graphics/1000 and Datacap/1000, HP said.

Pascal/1000 costs \$4,000 with deliveries scheduled for April, the vendor said from 150 Page Mill Road, Palo Alto, Calif. 94394.

Purchase Orders Tracked For Users of CS, Eclipses

GLENDAL, Ariz. — Software that generates and tracks purchase orders for Data General Corp. Commercial Systems (CS) and DG commercial Eclipse systems is available from Advanced Systems Consultants, Inc.

The purchasing system is implemented in interactive Cobol (for CS systems) and can be translated to AOS Cobol for the Eclipse systems, the vendor said.

The software was designed for users running CS Cobol developed by Mini-Computer Business Applications, Inc. (MCBA). The software interfaces with MCBA's Order Entry/Invoicing and Accounts Payable packages.

The purchasing system also con-

forms to MCBA's documentation and coding standards and can be used for stand-alone execution.

Software Features

Features of the purchasing system include maintenance and printing of purchase orders; provisions for drop shipments; multiple vendor addresses; multiple branch locations; tracking of inventory and noninventory items; retention of back-ordered items; open purchase order reports by vendor and item number; item receipt verification; and expediting reports.

The package costs \$3,000; multiple CPU discounts are available.

A demonstration tape costs \$25, the vendor said from Suite 5, 6802 N. 47 Ave., Glendale, Ariz. 85301.

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'Lamp' Lights Utility Reporting

AUSTIN, Texas — The Load Analysis and Market Planning (Lamp) software for electric utilities running IBM 30, 4300, 370 or 360 series mainframes is available from Intel Corp.'s Commercial Systems Division.

Lamp uses Intel's data base management technology to meet the requirements of the Public Utilities Regulatory Policies Act, the vendor said. Section 133 of that act requires power utilities to report the kilowatt hours of electricity used on an hour-by-hour basis and perform various kinds of analyses on power consumption.

Lamp allows analysts to combine load market data in a common data base to perform load analysis and answer market-related questions, according to Intel.

Lamp features include an English-like query language; the ability to operate in either interactive or batch mode; the production of seven standard reports; a Cobol interface; a report writer; and a teleprocessing monitor interface.

Lamp runs under OS/V5, DOS/V5 and DOS/VSE with CICS. It requires a minimum of 200K bytes of memory and costs \$102,000, Intel said from 12675 Research Blvd., P.O. Box 9968, Austin, Texas, 78766.

Two Seminars Set On Queuing Theory

SAN FRANCISCO — A three-day seminar on queueing theory will be presented March 5-7 here by Technology Transfer Institute.

Designed to give attendees a sufficient knowledge of queueing theory to address modern engineering problems, the course will be presented by Dr. Leonard Kleinrock, professor of computer science at the University of California at Los Angeles.

A similar course will be offered March 5-7 in Boston by Dr. George Fishman, professor of operations research and systems analysis at the University of North Carolina. The Boston seminar will also feature a discussion of the analysis of the output obtained from simulation, TTI said. Each course costs \$675 and includes documentation and lunches, TTI said from P.O. Box 49765, Los Angeles, Calif. 90049.

Credit Snags Send Batch Clothier On-Line

Special to CW
MEXICO CITY, Mexico — Inaccurate accounting data and lags in billing, payment updating and fielding customer credit account inquiries led a retail clothing chain here to scrap its batch credit verification method in favor of an on-line system.

Before implementing a credit-accounting data base and an on-line credit verification system, Suburbia in Mexico City collected all credit information manually and transferred it to punched cards. The cards were then submitted on a monthly basis for batch processing on a 385K-byte IBM 370/135 mainframe at Suburbia's parent company's DP arm, Servicios de Informatica.

However, Suburbia's physical growth over the years into a chain of eight stores and a concurrent increase in credit sales began to tax the capabilities of the batch system.

With credit sales accounting for an average 4,000 transactions daily — and reaching between 10,000 and 20,000 daily during seasonal and holiday

peak shopping periods — "there were problems with the accuracy of the accounting data and an elaborate and time-consuming error-correction cycle associated with the keypunch method," according to Credit Manager Santos Zuniga.

Further, Zuniga said, "we had a potentially serious cash-flow problem because we didn't have as much control in identifying overdue accounts as we would have liked."

Best Solution

After examining several alternatives, management agreed that the best solution to the problem would be a data base and data communications system for credit management that could be expanded to include other applications at a later date.

Suburbia chose Cullinane Corp.'s IDMS data base management system and installed it on the 370/135 under DOS/V5. The software was interfaced with IBM's Customer Information Control System teleprocessing monitor to support a network of IBM 3270

remote on-line terminals installed at each Suburbia store for use by authorized credit department personnel and at a central credit authorization pool at corporate offices. The interactive CRT terminals communicate with the central computer at Servicios de Informatica via private telephone lines.

The data base file structure, Zuniga said, integrates all credit information into one centralized system and interrelates data logically depending upon the particular function to be performed — such as credit authorization, invoicing, sales audits, tracking and identifying delinquent accounts and crediting refunds.

The use of a central integrated data base has eliminated the problem of data being inconsistent from one file to another. In addition, inaccurate billing no longer occurs because customer payments and refunds are credited "immediately," he noted.

Under the present system, one transaction automatically performs several functions.

For example, a cashier calls the central pool and gives the customer's number or name and the amount of purchase. An operator calls up the customer's file on the CRT screen and determines credit limits.

At the same time, the customer billing file and other related files are updated automatically, Zuniga explained.

This daily balancing of sales recorded in the cash registers against credit sales recorded in the computer system has "significantly" improved accounting control, he added.

In addition to the on-line credit management applica-

tion, Suburbia uses the data base as an information resource for periodic batch reports, produced through Cullinane's IDMS/Culprit report generator software.

Before implementing the IDMS system, "there was virtually no data base experience in Mexico," remarked Jose A. Galaz, general manager of Servicios de Informatica. "Developing the credit management system was, therefore, a learning experience for us," he added, admitting "we had some design problems, but solved them by working closely with Suburbia management to define its needs."

Shipping-Billing Gap Closed

By Dick Packman

Special to CW

ELK GROVE, Ill. — What did a computer do for us? Within six weeks after installation of our system, our company's two-week lapse between shipment and invoicing was replaced by next-day billing. I don't have to elaborate on the dramatic impact that has on cash flow.

Now, only six months later, our DP operation has enabled us, a relatively small supplier in the office products field, to compete in the marketplace with large, national companies.

Problems with billing at our firm, Tempo Office Products, started me looking at computers. But having no DP staff and no knowledge of computers, I had "buyer's phobia" — I wasn't sure if and how computers would work for us.

After looking at a variety of systems, I chose Systems Management, Inc. (SMI) of Rosemont, Ill. I was familiar with SMI and felt they had the computer sophistication and know-how I lacked.

Because of my skepticism about computer capability, I made arrangements to rent the hardware — a 10M-byte Microdata Corp. Reality system with a 75 char./sec printer and two CRTs — from a third party. But I bought a portion of SMI's Business Control Programs — accounts receivable inventory and billing.

Despite the relatively short time we have had the system, I

have been thoroughly converted from a computer skeptic to a believer. We now have a system on order consisting of a 50M-byte Microdata Reality with a 600 line/min printer and five CRTs.

We have developed our own marketing analysis program, which we are having copy-righted. With this program, we expect to double our sales this year. In addition, we intend to add SMI's Sales Analysis module to our system.

None of this would have been possible without the assistance of our vendor. In fact, with SMI's support and the high-level inquiry and retrieval language — Microdata's English — on our system, I don't foresee any need to hire DP personnel.

If there is any advice I can give to a company looking at computer systems for the first time, it is this: Carefully determine your needs and then spend your money with a company that sells both the hardware and software to fill those needs.

And make sure that the information you put into the system is accurate. Take the time necessary to do this, as it will save you a lot of hours and headaches in the long run.

Although all of us at Tempo Office Products are still working the same number of hours, we are working smarter — more profitably.

Packman is president of Tempo Office Products in suburban Chicago.

Novas Using Extended Basic Get Indexed Access Method

NEW YORK — An indexed access method for Data General Corp. Nova users running Extended Basic is available from Stratmar Business Solutions Corp., a division of Stratmar Systems, Inc.

Called KAM, the package allows programs written in Extended Basic to randomly add and retrieve records based on a user-defined alphanumeric record key.

It also retrieves records in a logical record key sequence, protects files and uses partial keys and multiple record keys, the vendor said.

The utility programs are selectable by a utility menu. Access routines for adding, changing, deleting and retrieving records are incorporated into a single subroutine that is included with the user's application program.

The access subroutines require 3.5K bytes of memory in an application partition, and each subroutine can simultaneously handle up to three KAM files.

The package costs \$765, the vendor said from 385 Madison Ave., New York, N.Y. 10017.



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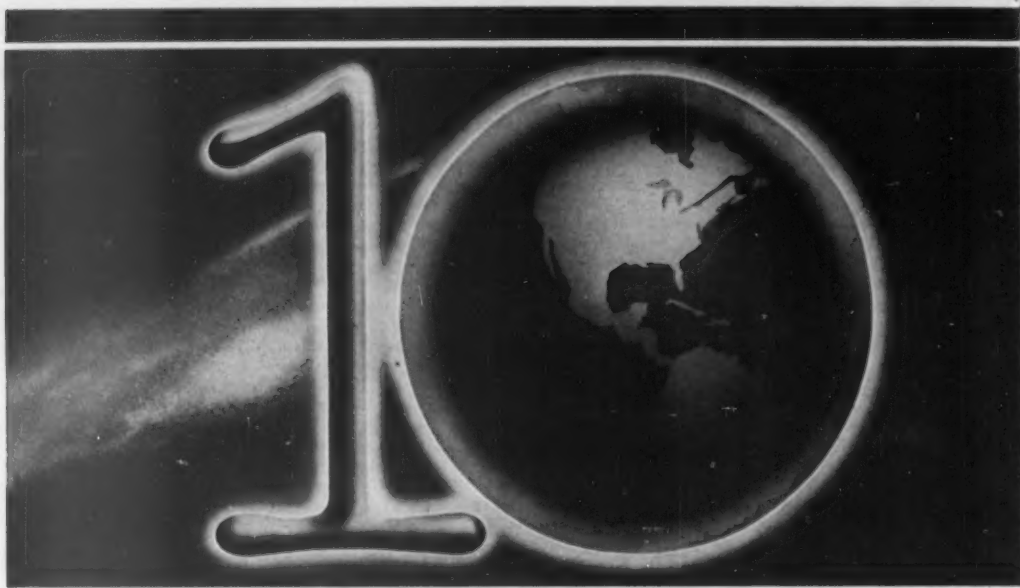
"Technologies of immense social and industrial potential will transform social and economic patterns in the coming decade."

James Martin

"The corporations which will excel in the 1980s will be those that manage information as a major resource."

John Diebold

1980s: The Information Decade



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Information Technology in the Eighties

We are witnessing an unparalleled change in communications and information processing. Computing equipment and telecommunications costs have plummeted for everything from micro to maxi computers, from "dumb" terminals to "intelligent" terminals. At the same time, software systems are more sophisticated and productive. The result? A proliferation of distributed intelligence that can be tailored to an organization's needs.

Only by implementing such systems can organizations adapt themselves to meet the needs of the 80s. The proper use of information systems technology will be essential for attaining high productivity and for meeting the many other challenges the 80s will bring.

A Conference for the Eighties

Help prepare your organization for the 1980s by attending DELTAK's 1980 International Data Processing Training Conference. This conference is designed to provide organizations with the expertise to put information systems technology to work.

DELTAK's conference will have something for everyone who must deal with information systems. Top-level executives will receive a timely analysis of business and technological trends. Instructors, training coordinators, and training managers will hear presentations on the latest products and techniques in Human Resources Develop-

ment. Data processing managers and technical staff will learn about the skills needed to master the proliferating technology of the coming decade.

Main Sessions Feature Diebold and Martin

Main session speakers will present topics of broad technical and managerial concern to the entire conference group. This year's conference will feature James Martin and John Diebold, internationally recognized authorities on the social and organizational implications of technological change. Mr. Martin will discuss rapidly evolving telecommunications and computing technologies. He will focus on the social and economic changes caused by these technologies and their effect on business and industry. Mr. Diebold will discuss strategic issues surrounding Information Resource Management, an approach designed to help organizations manage the information explosion of the 1980s.

Kevin O'Sullivan, executive director of the American Society for Training and Development, will give his multimedia presentation "The Great American Teaching Machine," an entertaining analysis of television's effect on the nation's viewing audience and its consequences for trainers everywhere. Other main sessions will feature selected DELTAK executives reporting on DELTAK's newest products and services in the data processing and management development disciplines.

Concurrent Sessions Focus on Specific Needs and Interests

More than a score of concurrent sessions will be presented, each one zeroing in on a timely topic for executives, training professionals, or data processing specialists. Frances Berger, Rob Ware, John Toellner, William Oncken, and Peter Pipe are just a few of the many outstanding concurrent session speakers. Among the sessions offered will be presentations on Computer-Assisted Instruction, Personnel Trends in Data Processing, the Dynamics of Management Training, and Planning for a Conversion.

Registration

The fee of \$175 will cover all sessions for the two days, plus receptions, breakfasts, and lunches. To register, call or write to Sharon Trube, DELTAK, Inc., 1220 Kensington Road, Oak Brook, IL 60521, (312) 620-0700.

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Pitfalls for the Unsuspecting Flood of Electronic Mail Offerings Seen

By Brad Schultz
CW Staff

WASHINGTON, D.C. — The decade's earliest electronic mail offerings may come fast and furiously — with serious pitfalls for the unsuspecting user, according to Yankee Group's president, Howard Anderson.

"Technology is coming almost too quickly for users to assimilate," Anderson told a session of the recent Communication Networks '80 conference here. Cost-justifying electronic mail is not as simple as it used to be; the prudent user may need a full two years to get a system up and running.

Electronic mail gives the user "nonsimultaneous time to solve nonsimultaneous problems," Anderson observed. That means the user can store "problems" as they come through the network in the form of electronic mail and then address those problems on a priority basis when convenient. Thus, the main benefit of electronic mail is saved time — otherwise known as enhanced productivity.

At present, the typical user must determine that electronic mail will boost corporate productivity by at least 4% over the long run to justify its implementation, Anderson said. In many large organizations, he added, "mass sign-off approval" for an implementation proposal may require evidence that a 20% productivity hike will result.

Market Dominance

According to the management consultant, electronic mail will replace telephones as a primary means of commercial communications, which is why AT&T, the world's largest carrier of commercial telephone calls, is working towards dominance in the electronic mail arena. Accustomed to doubling its profits every five years, he continued, Bell must diversify away from the phone business to maintain that lucrative pace.

Anderson said that Bell's investment in intrabuilding wiring may give it an inherent and seldom-noticed advantage over aspiring competitors. Carriers and terminal vendors

that control the user's building and local networks will determine how that user can best implement electronic mail and other telecommunications functions. As Anderson put it, "Bell has you by the local loops."

Drawing a contrast between AT&T's service proposals and the projected offering

'Anderson noted that satellites work well for the first 46,000 miles of transmission. But there's a real problem in delivering messages over the last 46 feet.'

from Satellite Business Systems (SBS), Anderson noted that satellites work well for the first 46,000 miles of transmission. But there's a real problem in delivering messages over the last 46 feet.

With its first satellite launching now scheduled for October, SBS has focused on (Continued on Page 48)

Message Switch Handles 2,000 Terminals

By Brad Schultz
CW Staff

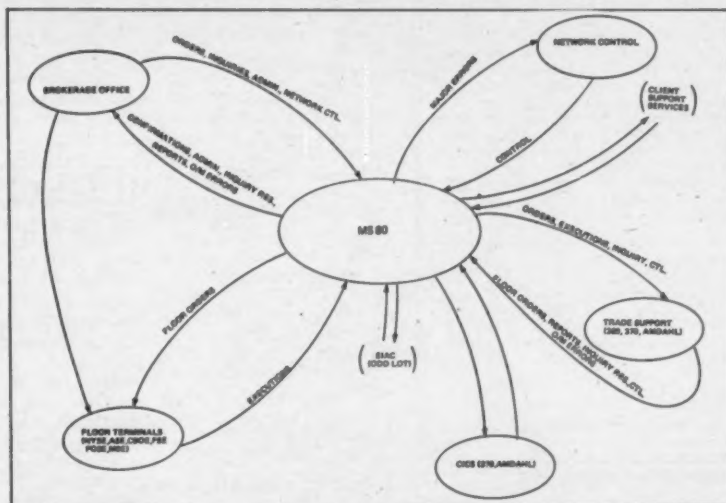
NEW YORK — Supporting IBM's 2780/3270 and other protocols, a message switch based on Digital Equipment Corp.'s PDP-11 minicomputer family that handles up to 250 asynchronous and 64 synchronous lines and as many as 2,000 terminals is available from Conversational Systems Corp. (CSC).

Already serving two large users, the MS80 message switch runs under DEC's standard RSX-11M operating system to deliver services that range from purely interactive to more accountable store-and-forward, a spokesman maintained.

In describing the MS80's features, CSC emphasized an aspect significant to any switch: the scope of equipment, protocols and services the machine can handle.

Besides contemporary IBM terminals, the switch supports certain Bell protocols, TWX, direct distance dialing, Western Union Telegraph Co.'s domestic Telex and the international Telex offerings of Western Union International, Inc., ITT and RCA Global Communications, Inc.

(Continued on Page 44)



Nearly one-fourth of the New York Stock Exchange's daily order volume is reportedly switched by the MS80 configuration shown above that links a number of IBM and Amdahl Corp. mainframes.

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Switch Handles 2,000 Terminals

(Continued from Page 43)
"Designed and developed" for the PDP-11 family, the MS80 is actually a series of switches based on DEC's PDP-11/44 through PDP-11/70 models, the spokesman noted.

The MS80 will function with any DEC disk drive supported by RSX-11M, the spokesman added. That would include DEC's RK05, RK06 and RK07 drives and the RM02, RM03, RM04, RM05 and RM06

drives.

Other DEC peripherals can be accommodated, the source continued, because all I/O is done through the RSX-11M structure.

According to CSC, all line services can support speeds as fast as 9,600 bit/sec with the appropriate communications interface. The MS80 fits DEC's DJ11, DH11 and DZ11 asynchronous multiplexers and the mini maker's DV11 synchronous multiplexer and

DN11 autodialer interface.

Optional 56K bit/sec synchronous interfaces and bit-oriented interfaces are reportedly available.

Security Features

In the area of accountability and security, the MS80 is said to feature user-definable sub-networks and user-definable security and routing restrictions. From this standpoint, the user can define 31 distinct classes of stations and 31 classes of messages.

Other features enable the user to monitor the flow of messages in order to log who receives them and when they were received. And, according to CSC, recovery from any network "crash" can be achieved in less than five minutes.

In the area of network control, the MS80 reportedly features operator control emanating from any eligible network station, on-line modification of poll/select codes and polling patterns and the ability to change communications ports without stopping the system.

Message Volume

The switch can process up to 10 messages (or 2,400 characters) per second. With the RP04 or larger disk drives, up to 250,000 messages can be handled daily, CSC said.

The MS80 has a special interface to user programs written in Cobol or Fortran and can be purchased with 300-, 600- or 1,000 line/min printers that function as on-line message-dumping devices.

The switch starts at \$75,000, depending on the user's traffic volume and network configuration. CSC is at 132 W. 31 St., New York, N.Y. 10001.

Report Details Rate Experiment

SPRINGFIELD, Va. — A procedure for designing an experiment to estimate time and rate parameters in a digital communication system is available in a report by the U.S. Commerce Department's National Telecommunications and Information Administration (NTIA).

Costing \$4.50, the document provides statistical methods for estimating parameters in compliance with proposed federal standard 1033.

According to NTIA, transmission of digital data can be characterized by such time intervals as delay times, disengagement times, period between outages, outage durations and bit, block and message transfer times.

The NTIA Report 79-21 may be obtained from the agency at 5285 Port Royal Road, Springfield, Va. 22161. Accession number is PB 297-977/AS.

Three Carriers Agree On Packet Net Protocol

VIENNA, Va. — Three major data communications carriers in the U.S., Canada and Japan have reached agreement on a common communications protocol for supporting binary synchronous terminals over their public packet networks.

The carriers are GTE Telenet Communications Corp.; TransCanada Telephone System, which runs Canada's Datapac network; and Kokusai Denshin Denwa Co., Ltd. (KDD), Japan's overseas telecommunications carrier.

The agreement will enable the carriers to introduce a compatible international data transmission service for this widely used class of terminals, according to a spokesman for GTE Telenet. Typical DP applications that run on binary synchronous terminals include remote batch and remote job entry, source data automation and word processing, the spokesman explained.

While Telenet and TransCanada's packet are already interconnected on an international basis, KDD is expected to offer packet-switching services to the U.S. and Canada through facilities of this country's international record carriers and Canada's Teleglobe.

The GTE Telenet spokesman said that the three carriers will be working with other common carriers and with DP equipment vendors to make compatible services available to data communications users on a worldwide basis.

Technical details of the binary synchronous interface for packet networks may be obtained from Sheldon L. Fox, manager of network interface design, GTE Telenet, 8330 Old Courthouse Road, Vienna, Va. 22180.

In other news related to Telenet, the GTE subsidiary announced it has certified DTSS, Inc.'s X.25 software. DTSS, a Hanover, N.H.-based service bureau, announced a year ago it would support X.25, the international standard protocol for packet-switching. The Telenet packet is reportedly used by most DTSS customers.

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Data Briefs Price Cut \$10 On CAT Modem

TARZANA, Calif. — Novation, Inc.'s CAT acoustic modem now costs \$189, a \$10 reduction.

The bit/sec answer/originate modem is reportedly Bell-compatible, has an RS-232C interface and weighs 1.5 lbs. Novation's address is 18664 Oxnard St., Tarzana, Calif. 91356.

Videotext Book Gives First-Hand Reports

WHITE PLAINS, N.Y. — Videotext: The Coming Revolution in Home/Office Information Retrieval reportedly contains first-hand reports on experiments with remote data base services in England and the U.S.

Costing \$24.95, the book is published by Knowledge Industry Publications, Inc., White Plains, N.Y. 10604.

Teleray Terminals Come In RS-310C Rack-Mount

MINNEAPOLIS — All smart terminals from Research, Inc.'s Teleray Division are now offered in RS-310C rack-mount configurations.

Detached and panel-mounted keyboard versions cost \$280 and \$322, respectively.

Teleray's address is Box 24064, Minneapolis, Minn. 55424.

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Higher Frequency Band Open by 1990s? Nasa Working to Increase Satellite Capacity

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — A massive research and development program aimed at substantially expanding U.S. satellite communications capacity has been launched by the National Aeronautics and Space Administration (Nasa).

The program is focused on opening the 20 GHz to 30 GHz frequency band to commercial users by the early 1990s, when growing traffic is expected to saturate the satellite systems operating at lower frequencies.

During fiscal years 1980 and 1981, Nasa plans to spend nearly \$30 million on producing a satellite capable of operating at 20 GHz to 30 GHz, according to John McElroy, director of the agency's Communications Division.

Satellite 'Rationing'

McElroy and another panelist at the recent Communications Networks '80 conference here — RCA American Communications, Inc. Vice-President Harold Rice — indicated that satellite facilities may become saturated long before the Nasa system is offered.

Rice reported that his company has been "out of circuits" since September 1978. Western Union Telegraph Co., he added, recently began rationing its Westar satellite capacity.

RCA has enough orders currently on hand to fully utilize the capacity of two additional satellites, Rice stated. This backlog exceeds commercial demand projected for the year 2000 by recent ITT and Nasa studies.

Transmission Speeds

Another panelist, Dr. Eugene Cacciamani Jr., vice-president of American Satellite Corp., predicted that the lower limit of satellite data transmission speeds will soon be 9,600 bit/sec.

Later in this decade, small, inexpensive earth stations supporting high-powered satellites will provide a variety of information and image-processing services direct to the home, Cacciamani added.

Dr. Robert S. Cooper, engineering vice-president of Satellite Business Systems, told the session his company will begin work on its second-generation facility this year. Scheduled for a 1986 launching, the system Cooper described will feature an improved transponder designed specifically to send the receive digital signals.

Cooper said the spacecraft will also employ cross-polarization to increase frequency utilization and dynamic, on-board switching capability.

Another carrier's vice-president, Billy Oliver of AT&T Long Lines Division, estimated that Bell will have 20,000 satellite voice circuits running by the end of this year, compared with 14,000 circuits at present.

Recent "quality of service" studies show that the satellite voice circuits — when equipped with a newly devel-

oped echo canceler — transmit phone conversations with the same quality terrestrial circuits provide, Oliver said.

The echo canceler is reportedly about one-fourth the size of a postage stamp.

Satellite Business Systems is reducing the number of bits required to transmit voice messages digitally, Cooper noted. Next January the firm

will use a 32K bit/sec encoding scheme for voice messages passed through its first generation spacecraft, slated for launching this fall.

Commercial digital voice transmission systems presently require a 64K bit/sec bandwidth, Cooper pointed out. By 1986, he maintained, use of digital speech interpolation is likely to produce a 16K

bit/sec voice-encoding system.

Bandwidth may eventually be reduced to 9,000- or 10K bit/sec, the carrier executive added.

AT&T plans to launch its second-generation satellite, a follow-on to the present Comstar facility, in the spring of 1983.

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TEXAS INSTRUMENTS

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Onrush of Electronic Mail Offerings Predicted

(Continued from Page 43) the broadcast link between the user's rooftop "earth station" — a dish antenna several feet in diameter — and the satellite orbiting about 23,000 miles up in outer space.

But, Anderson claimed, SBS neglected the problem of forwarding the transmission from the roof site to the user's terminals, presumably a few floors below in the building.

However, the joint venture of IBM, Communications Satellite Corp. and Aetna Life & Casualty Co. will probably solve this 11th-hour wrinkle, the Yankee Group president surmised. He expects SBS to make nothing this year, but earn about \$15 million in 1981 and post some half a billion dollars in revenues for 1985.

Meanwhile, the user trying to make sense of these devel-

opments must also take stock of Xerox Corp.'s Xerox Telecommunications Network (Xten) project, currently under review by the Federal Communications Commission.

Anderson considers Xerox's recent purchase of Kurzweil Computer Products, Inc. a poignant move in the Xten campaign. The latter firm's founder, Raymond Kurzweil, received the Association for

users will need to merge data, voice, facsimile and video transmissions as well as to assimilate different types of equipment, interfaces and protocols.

AT&T is already perfecting this sort of controller, he said, for operation on the customer's premises or accessibility through Bell's Advanced Communications Service.

neous transmission of data, facsimile, voice and video at 56K bit/sec (CW, Feb. 4).

What will Xerox do in the meantime to counter AT&T's strategy? Anderson predicted that Xerox will buy a mini-computer manufacturer soon and put it to work on a super-controller project.

The Decade Ahead

According to Anderson's vision of the decade ahead, global markets, political relationships and individual lifestyles will be reshaped as a voice technology continues to merge with computer technology.

There are important reasons, he said, why Exxon Enterprises — one of the world's largest petroleum companies — presently has, by Yankee Group's count, 14 subsidiaries in the DP industry — some of them committed to development of computer speech recognition.

Citing salesmen as an example of the people who would benefit from integrated voice/data electronic mail, Anderson estimated that every day a typical salesman spends four hours fighting with his home office, three hours doing front office work and two hours working with customers. The home office "fight" and much of the other activities now entail telephone work that electronic mail can eliminate.

'Anderson predicted that Xerox will buy a minicomputer manufacturer soon and put it to work on a supercontroller project.'

Computing Machinery's Grace M. Hopper Award in 1978 for his invention of a computer system that converts text to voice for blind people.

The Kurzweil acquisition shows that Xerox may offer text-to-voice services incorporating telephone circuitry, Anderson said.

In a few years, customer executives may routinely dial up their host computer system and listen to EM correspondence that was initially routed to the host via facsimile or conventional digital transmissions.

Anderson pinpointed what he considers a major gap in Xerox's arsenal for the anticipated carrier war: a facility for manufacturing the controllers

Called Antelope, Bell's "supercontroller" will meet the user's growing need to consolidate technical management of various forms of telecommunications, Anderson said.

Yankee Group expects Antelope to support six emerging Bell services and encompass teleconferencing, voice store and forward, electronic mail, environmental monitoring and control, computer query response, data base management and Cobol.

But before the Antelope debuts (in 1983, according to Yankee Group), more modest designs will be set to graze in the data communications coral. At the conference, for example, American Satellite Corp. introduced an intelligent controller for simulta-

ATMs Give Student Allowances

MONROE, La. — College students here in northern Louisiana are getting their allowances from banking terminals under limitations set by their parents.

"Allowance-by-computer" is featured by the so-called Liberty network linking 36 IBM automated teller machines (ATM) in 26 cities to 18 banks in this largely rural area.

The service was programmed into the data net as a convenience to parents and to spare young people the hassles and expenses of check-cashing, according to Rodney Johnson, senior vice-president of Monroe's Ouachita National Bank.

Local Accounts

College students in the vicinity usually have a hard time cashing out-of-town checks, Johnson explained. So they open local bank accounts where they must pay a service charge and buy checks.

"We noticed that these accounts were responsible for a large number of 'NSF items' (bad checks drawn on accounts with insufficient funds), and these were costing the students dearly," the banker pointed out.

For example, "a student would write an 87-cent check at a convenience store and because there wasn't enough money in his account, he'd have to pay a \$5 NSF charge," Johnson said. "That's pretty tough interest for the amount of money involved."

Ties With Home

"So we came up with an idea: let's let the student maintain an account in his home bank or let's give him a card and relate it to his parent's bank account."

That's how allowance-by-computer works. Parents who have checking accounts at any of the banks connected to Liberty can authorize their son or daughter to withdraw a certain amount of money each month.

Different Password

The bank then issues the student a personal Liberty card made of plastic and featuring a magnetic stripe with coded identification data.

The student simply inserts the card into any Liberty ATM and keys in a password number (different from the parents' password) to obtain the proscribed allowance.

The ATMs are driven by an

IBM 370/138, which determines whether the transactions are authorized.

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Unit Tests Phone Line, Modem and Terminal

UPPER SADDLE RIVER, N.J. — A diagnostic teleprocessing tester that connects to terminal and modem equipment via a system of "in-line" adapters has been unveiled by Macwell Data-comm, Inc.

The microprocessor-based, programmable Autotester continually monitors the performance of the telephone line, modem and associated terminal, informing the operator of an error with an alarm and by displaying a two-digit LED error code on its front panel.

Autotest checks to see that the RS-232C/V.24 interface cables are connected and that the modem and terminal are powered up. Further, it monitors the modem-terminal interface to see that it is being controlled correctly, Macwell said.

At the modem level, the unit tests the telephone side of the modem for incoming and out-

going carriers, checking the amplitude and frequency of the carriers to ensure they conform to the telephone line specification.

At the protocol level, Autotest can check the protocol being used by the terminal to see that it is operating correctly. Gross structural specifications or protocol failure will cause an error code to be displayed, according to Macwell.

The tester, which can be connected up to 100 ft from the equipment it is monitoring, costs \$3,000, Macwell said from 116 Rt. 17 N., Upper Saddle River, N.J. 07458.

Field Sites Get Communications

NEW YORK — Regional or field offices of multidivisional corporations can be equipped with complete communications capabilities for about \$15,000, according to Advcom, a division of Intelligent Computer Systems, Inc.

Advcom has introduced a software package called Omicron that enables the user to establish "worldwide" data communications on Texas Instruments, Inc. intelligent terminals — including the TI 771 and the DS990 Model 1 — and on the 774 multistation mini-computer and of the TI 990 models 4, 6, 8, 20 and 30.

An Omicron system would include 4M bytes of storage, a

choice of printers and the TI terminals or minicomputers, operating either over asynchronous dial-up lines at 1,200 bit/sec or within a packet-switching network.

Omicron can transmit or receive up to four pages of text coast to coast in 1 min for about 5 cents, according to the vendor. It has three processing capabilities:

- Word Processing. This module contains automatic centering, global search and replace, name replacement, justification, pagination and optional page and/or line numbering.

- Electronic Courier. This addresses and routes elec-

tronic mail, allowing up to 21 addresses to be designated at one time.

- Communications procedures. Documents under control of the Electronic Courier are transmitted via this routine to users in remote offices.

The software alone costs \$7,500, while a TI Model 990 Model 1 costs \$9,450; a 150 char./sec dot matrix TI 810B printer operating at 1,200 bit/sec costs \$2,745. An alternative Xerox Corp. 1750 impact printer running at 45 char./sec with communications speeds of 9,600 bit/sec costs \$3,850, Advcom said from 540 Madison Ave., New York, N.Y. 10022.

'Optymus' Aids In the Design Of Voice Nets

BETHESDA, Md. — A tool for those designing voice networks has been released jointly by STSC, Inc. and Telco Research Corp.

APL Plus Optymus is software that determines the best allocation of lines to specified service groups and takes into account such factors as call queuing and route advance systems, overflow, FX and Wats groups and interstate and intrastate systems, according to the vendors.

To design a voice network, Optymus uses vertical-horizontal (V-H) coordinates, rate center and tariff data published in Federal Communications Corp. Tariffs 260 and 264.

This data is organized into two very large data bases, STSC said. One contains the V-H coordinates for more than 23,000 North American centers. The other contains the private-line, Wats and Direct Distance Dialing rates for a variety of interstate and intrastate services.

Both data bases are updated periodically in response to published tariff changes, according to STSC and Telco.

Cost for the Optymus service is assessed on a per-use basis, but requires a one-time \$750 fee, plus travel expenses, for one day of on-site training. A large network could cost \$45 to evaluate and \$800 to optimize, although the user can save money by forwarding a request for optimization for overnight — instead of immediate — processing. This would reduce the cost to about \$500, STSC said from 7316 Wisconsin Ave., Bethesda, Md. 20014.



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Message Switcher Unveiled

LAKE VILLAGE, Calif. — A microcomputer-based system with text editing and a store-and-forward message-switching capability was introduced by Franklin Systems Corp.

Converter Runs Off Terminal or Modem

DANBURY, Conn. — An asynchronous-to-synchronous converter that operates on power from the user's terminal and modem is available for \$315 from Tri-Communications, Inc. at 155 Main St., Danbury, Conn. 06810.

The Asci-1 interface converter runs in the 1,200- to 9,200K bit/sec range.

It also features loopback switches to isolate malfunctions and confirm that components are operational.

Known as the TC/2 Telecommunicating Electronic Message Processing System, it was designed to communicate with other systems over phone lines via three ports — Telex, Teletype-writer, Direct Distance Dial — or private lines using Ascii or bit-oriented code.

The system includes a CRT terminal with dual Zilog Z80 microprocessors, a 48K-byte dynamic buffer, 100K-byte minidisk drive, a 30 char./sec dot matrix printer and Franklin disk-resident control software.

The TC/2 also runs as a stand-alone system or as a down-link-loaded intelligent terminal. The TC/2 costs \$7,850 or can be rented and leased for \$375/mo and \$150/mo, respectively. Franklin Systems is at 733 Lakefield Road, Westlake Village, Calif. 91361.

Community College Installs Bar-Code Checkout System

By Jay Woodruff

CW Staff

BEL AIR, Md. — A terminal network similar to that found in supermarkets has helped a college located among northeastern Maryland's farmlands tighten up its library lending system.

While the on-line system at Harford Community College's Learning Resources Center is still some way from the point where it performs all the applications planned for it, it has still "given us greater control of what resources we have than we had before," according to Harold E. Stark, head of library services.

The center uses five IBM 3270 CRT terminals with on-line access over mo-

dem and phone lines to a 256K-byte IBM 370/125 mainframe and a data base of more than 56,000 book titles. Three of the terminals incorporate optical bar-code readers to scan material checked out of the center and the codes of student identification cards.

The school decided on the bar code system because the labels are easy to use compared with the traditional card-in-pocket checkout system. Instead of having to wade through the paperwork associated with a manual checkout system, library workers are free to use their time helping patrons find and use resource materials, according to Dr. Paul G. Yorkis, Harford's director for institutional development.

"Time out for each book is reduced, and there is the potential for a more rapid turnaround for our collection. It gives our staff the opportunity to learn new skills and the opportunity to work more with library users," Yorkis explained.

The system runs under IBM's CICS, "but it could have been authored in a number of languages," Stark said. "When we put the system together [in 1976], there were not a lot of packages available on the market. Now there are a lot of mass market packages that do what this one does, and some even surpass it."

To use the Learning Resources Center checkout system, each authorized library patron hands over an identification card and the materials he wants to take from the library to a circulation attendant. A bar-code reader is passed over the materials' barcoded labels and over the coded portion of the user's card.

That transaction is entered over phone lines into the 370's circulation files in another building and processed against two on-line master files.

The patron file contains data on each library user and the user's library transaction record. If that person has another book overdue or if the card is invalid, the CRT flashes an appropriate indication of the fact.

The materials file stores a bar-coded reference number for each of its holdings. If a requested item is out on loan, the borrower's name and the dates of the book loan and return are displayed.

The entire system was an in-house design, and it requires "a solid block of programming time" to be completed, according to Stark.

But it is not the school's only on-line system because interactive DP training is an integral part of the school curriculum, according to Yorkis. The 370 is also used for a variety of administrative and academic functions throughout this school of the 10,000 full and part-time students.

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Auditing the Integrated Data Base

When a company centralizes and integrates its information processing through the introduction of data base technology, fundamental changes in the approach to DP auditing will have to occur. In addition, changes will probably occur in the organizational structure, responsibility for data input and accuracy and information data flows.

To the DP auditor, the changes to and the complexity of data element interrelationships could make the evaluation of control a difficult task. It is, therefore, the intention of this article to present a workable approach to auditing an integrated data base. But first, a few concepts need to be presented.

A data base is a way to organize and store data in a structure that models the natural relationships of data in the real world. It can be likened to a sophisticated cross-referencing system. For example, if information concerning a particular vendor were required for a purchase order, one would use the vendor identification, go to the vendor file and find the required information. Then, if payable information were required, one would use the vendor account number to find the appropriate accounts payable data.

Much of conventional data processing involved taking various files — such as purchase orders, vendor master and accounts payable — and extracting the needed information. But by correctly defining the natural data relationships to the data base, purchase order information will automatically be reflected in data maintained on a vendor or in a payable account.

When the same data is used in various systems such as order processing and accounts payable, the data base becomes integrated. As a result of data base integration, processing is primarily data entry and reporting. The conventional processing of matching, merging and extracting data from various files has been eliminated. This change will affect the way an auditor should view and, therefore, audit any data base system.

Where to Start

Since changes to the organizational structure are likely to occur with the introduction of data base technology, a traditional answer as to where to start would be to obtain the new organiza-

tional structure. However, changes in the organization's structure do not lead to data base usage, but data base usage causes new responsibilities to be established. The proper first step, then, is to gain general knowledge and understanding of the data base management system (DBMS). Organizational impact will be analyzed in a later step.

Knowledge of the DBMS can be gained by reviewing vendor literature and by talking to the vendor and users of the DBMS. It is important that the auditor gain as much knowledge of the DBMS as possible independent of the organization's DP department. One's DP group might tend to be biased in favor of the DBMS it has selected. In addition, the final selection decisions tend to be based on performance characteristics and not necessarily upon control concerns. This occurs because DP departments generally try to process as much information as possible in the shortest time at the lowest cost.

To understand the nature of the DBMS, the auditor should know:

1. How data elements are defined.
2. How data record relationships are defined and any logical or software constraints.
3. The use of each of the data manipulation language (DML) commands, what could happen if the wrong form of a command is used and the physical and logical results of command execution.
4. What facilities and capabilities exist for the backup and recovery of the data base.
5. What provisions have been made for journaling (audit trails).
6. How utilities are intended to be used and the consequences of their misuse.
7. The degree to which data independence can actually be achieved.
8. What security facilities are available.

Once the auditor feels comfortable in his base knowledge, the next step is to gain a general understanding of the types of systems and data contained in the data base. This is a macro-level approach and would only require knowledge of major inputs, processes, outputs and data relationships. The data base design example in the figure shows the level of detail deemed necessary.

Of the information comprising the

data base, some elements may be more significant or critical than others. (In the example, actual invoice costs are more significant than an employee's history record.) Accordingly, management may have special security requirements surrounding this sensitive data. For example, government agencies have to comply with the Privacy Act, employee salary figures are not usually readily accessible or perhaps a special manufacturing process needs to be protected against disclosure to a competitor.

Upon obtaining this security information, the auditor is ready to begin the first phase of analysis.

The DBMS on the market today offer a variety of facilities to protect and provide for data accuracy and security. However, because these software packages were designed for an "average" user, the capabilities of the DBMS may not provide the level of security and control an organization deems necessary.

In addition, various controls can be selectively used or have to be implemented manually. Therefore, the auditor must evaluate the DBMS capabilities in light of corporate control and security requirements and determine where exposures to errors and irregularities could exist.

Once this list of exposures and weaknesses has been compiled, the next process is to find out what procedures have been adopted to strengthen the data base environment. Design and implementation of standard procedures and practices for data base systems are the responsibility of a data base administrator (DBA).

One of the first organizational changes that occurs is the introduction of the new function of data base ad-

(Continued on In Depth/3)

By James R. Krause

Model 204 DBMS

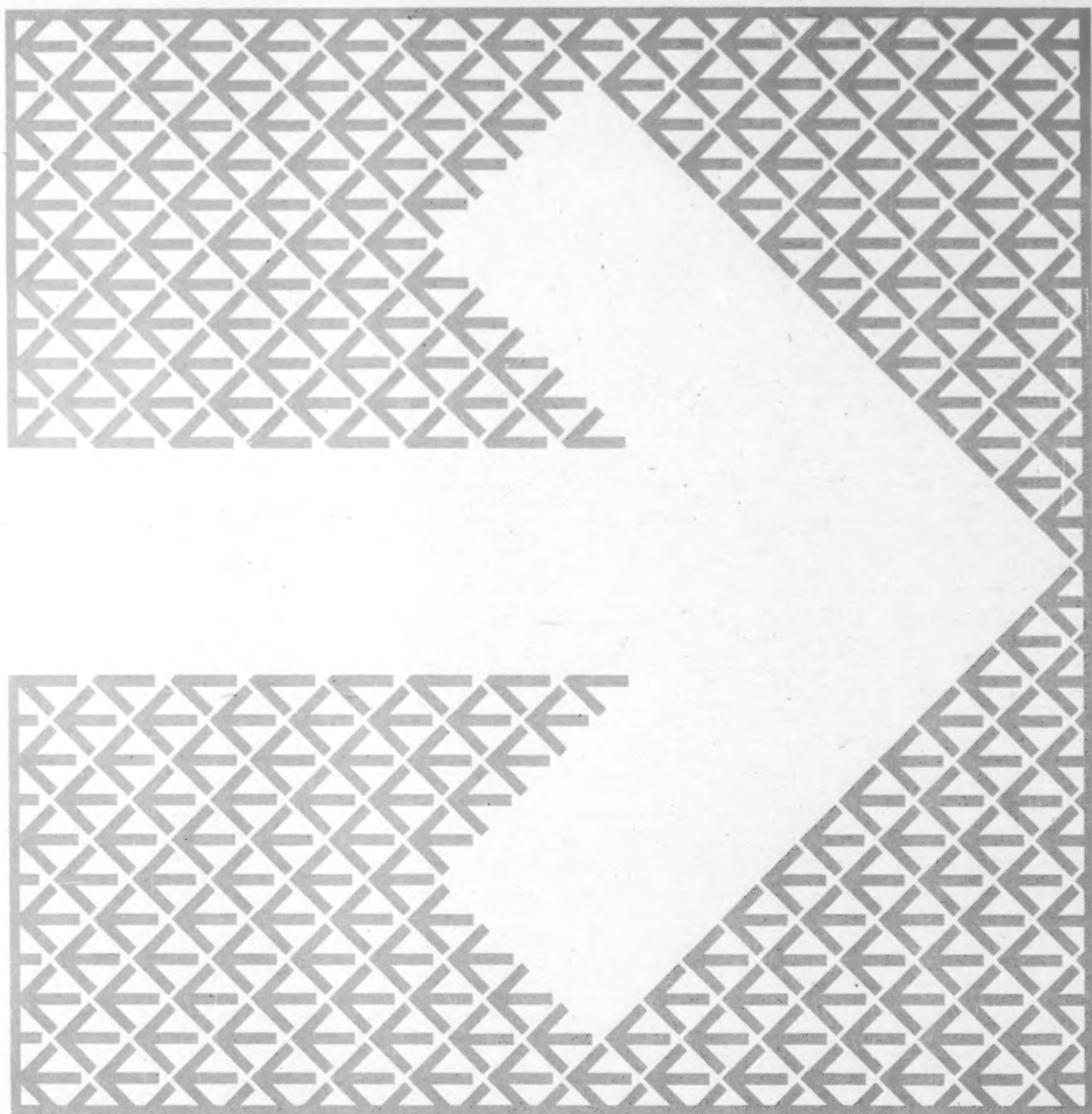
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BECAUSE MANAGING DATA MEANS MANAGING CHANGE

Computer Corporation of America

(Continued from In Depth/1)

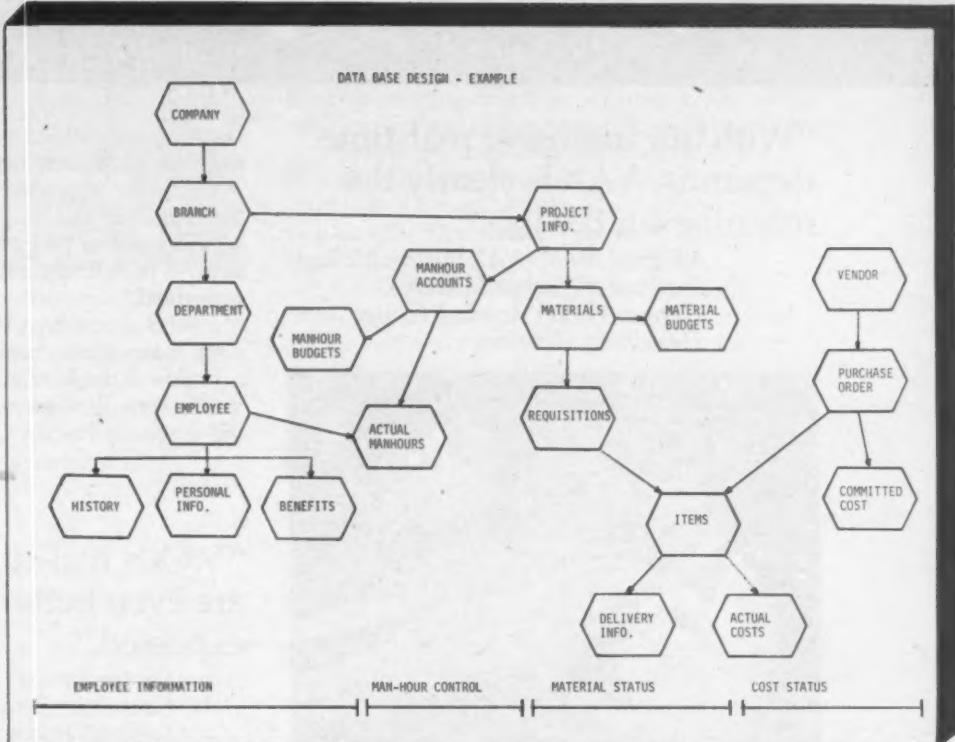
ministration. The DBA should be charged with the responsibility for data base control and administration. In this function, the DBA should:

1. Establish and review accesses to the data to maintain data integrity and security.
2. Establish and maintain the physical data base structure.
3. Define logical relationships to the DBMS based on user needs.
4. Maintain quality assurance of data base techniques and system interfaces.
5. Provide for the backup and recovery of the data base from unusual terminations and provide for appropriate audit trails.
6. Develop and communicate standards and procedures to both the user and DP communities to ensure effective utilization of data base technology. Standards should address at least the following:
 - a) Conventions for data element definition and naming.
 - b) Practices for DML usage.
 - c) Utility usage.
 - d) Application system design documentation requirements.
 - e) Maintenance and control of data base documentation.
 - f) Data dictionary updating and usage.
 - g) On-line inquiry and control constraints.
7. Monitor compliance with all company directives and procedures.

Review of these major functions leads to the conclusion that the DBA is a major control point in the data base environment. To a certain extent, this is true. However, the DBA should only be responsible for maintaining the physical data base, its performance and the integrity of the data irrespective of the applications processing against it. Establishment of logical relationships are the responsibility of the various application areas. Examination of the position description should reveal the DBA's placement in the organization, lines of authority, responsibilities and functions.

Recalling the list of exposures and weaknesses, analysis must be performed to determine whether the procedures developed by the DBA compensate for any DBMS shortcomings. Although the DBA can be looked upon as an important cog in the control environment, to a certain extent, he poses a threat. He has not only the knowledge but the ability to access and modify the data base.

In an integrated data base environment with all data redundancy removed, an error or irregularity affecting one record could have a disastrous effect upon the entire organization. This, coupled with the DBA exposure, demands that additional controls be developed to ensure the data's accuracy. But prior to investigating the need for additional control, one has to understand how the introduction of data base technology could change the organizational setting. Efficient and cost-effective controls can be implemented only when one accounts for



Depicted here is a company in the construction industry. Projects are assigned to a branch of the company and information is maintained on the status of cost of materials ordered. In addition, man-hours are accumulated by project and by individual for proper control. For internal corporate needs, the company structure is maintained and all relevant employee information provided.

organizational relationships.

Organizational Impact

The major reason for implementing data base is the reduction in data redundancy which reduces storage costs and the problems of data synchronization and keeps the same data element updated in many different systems. Because of these factors, many users will no longer be required to enter data into their own system, since the data is already in the data base. In addition, some user groups, because they are nearest the source, may have to enter data they will not necessarily use.

To understand this concept, refer to the sample data base design and consider the situation of company payroll. In our sample company, we have a design engineer who works on a variety of projects during any given pay period. Payroll's primary purpose is to pay an individual for his hours worked, and most payroll systems also allocate the amount paid to a departmental expense account. However, to be able to correctly cost our project, the engineer's hours worked have to be distributed to the proper project man-hour accounts. Therefore, a case could be made that an employee's time card should contain this time distribution and the project information should be entered at the time of payroll processing.

This should increase the overall processing efficiency of the organization

by not having to enter project data separately, yet it would possibly be an added burden for the payroll department to process data it does not need or use.

This was a relatively simple example, but the concept is valid. Introduction of data base technology will have an organizational impact. It should be apparent that data is no longer

application-dependent. The data base is a central source of company information, and it must be controlled as such. No longer does a simple file exist for a single user. One large master file exists for many users. Control of the data base now moves into the realm of what DP auditors call general DP controls.

(Continued on In Depth/6)

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"Also," Muller continues, "our image processing work made VAX's large program

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On ease of program conversion, Muller says, "We're finding it as simple as Digital promised."

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"VAX's real-time capabilities are even better than we expected."

*Dr. Jim Larson, Technical Staff
Electronics Research Center
Rockwell International
Anaheim, California*





"VAX's large address capacity makes it a powerful real-time machine."

*Dr. William E. Drummond, Chairman
Austin Research Associates
Austin, Texas*

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IN DEPTH

(Continued from In Depth/3)

One last point to remember is that the data base will exist in the DP environment. General DP controls, just as they applied in the conventional file environment, are needed to support the data base environment. What is important to recognize is that in a data base environment the distinction between general DP controls and application controls becomes more nebulous.

System Review

So far, this article has addressed those areas which could be called environmental concerns, DBMS capabilities, DBA standards and procedures and the organizational impact. The ultimate concern is whether the data is complete and accurate. The final, although most time-consuming phase, will be a review of the application systems, those systems which process and use the data.

As can be seen from the sample data base diagram, an integrated data base could be divided into systems. However, lines between systems are not clearly defined because an individual record type may participate in more than one system (integration).

The evaluation, if possible, should be broken down into a review of each system, but with special attention being paid to the points of integration. This piece-meal approach is proposed for two reasons. First, the evaluation of control is simplified by the reduced size and the logical relationships that exist between data elements. Second, an evaluation of the control requirements for integration points can be obtained by understanding the control needs in each system.

The starting point for reviewing a system is understanding what the system is to do and how the processing objectives are to be met. For the employee information system, the objectives are to maintain the company's organizational structure and to provide information on an employee for payroll and government reporting requirements.

At this point the auditor determines in detail how the information is to be used and the extent to which controls need to be established. The auditor must get down to the data element level of detail. For each data element (name, salary, Social Security number and so forth) a determination must be made as to whether the data element is critical or significant in light of the processing objectives of the system. For example, for payroll processing, the accuracy of the salary figure is highly critical, yet the accuracy of an employee's Zip Code is rather less significant.

All the defined usages of an element can be obtained from the data dictionary. All uses of the critical elements must be identified so that a determination of control adequacy can be made. Since various data elements will appear in a multiplicity of applications, at different times, and with the likelihood of different control require-

ments, how is it determined if controls are adequate? The following criteria, although simply defined, should provide the guidelines needed for control evaluation:

1. Comprehensive and effective editing and validation criteria should be designed to capture the maximum number of possible errors at the time of data entry. Feedback must be given to the users detailing action taken as a result of transaction.

2. Periodic file balancing, scanning

and correcting operations should occur to ensure data integrity over time.


3. Control totals should be reconciled with processing results when appropriate.

To state these criteria a little less formally, we want to ensure that only accurate, complete and valid data is entered into the data base and that the data is periodically checked to ensure its accuracy, completeness and validity.

The concept of periodic balancing


could be one of the most important control procedures in data base systems. This balancing or data validation needs to be accomplished independent of normal processing because, in an integrated environment, one data element will be used at different times by many different systems.

Consider the following. Most payroll systems balance or validate employee salary rates before processing. By itself, this is a good control procedure for payroll processing since any error



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IN DEPTH

in rates would be identified prior to processing the payroll.

But let us imagine that payroll occurs on the 15th of the month, but we cost projects at the end of the month. All through the month, employee rate changes are occurring, and the data base is updated, but an error is made. It is conceivable that this error could affect the project costing and go undetected since the month-end processing would be completed prior to the next payroll rate validation.

The question arises as to whether the project costing staff should maintain a control procedure to verify its processing accuracy. To them, the responsibility for salary rate accuracy belongs to the payroll function. In addition, the engineer may charge hours in one pay period, but not another. Therefore, it is unreasonable to expect project costing to maintain this type of control unless they maintained their own rate master file. But, maintenance of a separate file is against the philosophy of

data base use.

Therefore, a primary user should be designated responsibility for a data element's accuracy. Then, that user must periodically ensure the data for which he is responsible is verified, regardless of whether that user's application is processed. The frequency with which the periodic validation should occur will be dependent upon the use and criticality of a data element.

By placing all the eggs (data) in the

same basket (a centralized data base), an organization increases the risk of a single error having a significant impact. The advantages of data base use are many, but unfortunately the risks can also be great.

Conscious Effort

Overcoming the potential weaknesses requires a conscious effort on behalf of both the DP community and the system users. Different ways of maintaining control must be implemented because of the changes in technology. One cannot assume that a technique that worked in the conventional file environment is adequate or even desirable in the data base environment. The data base is a resource of the company, and it must be controlled irrespective of the applications processed against it.

The auditor must evaluate the adequacy of the data base environmental controls (DBMS, DBA standards, organizational changes) and then proceed to determine whether the application control procedures complement the environmental controls to ensure data accuracy. Although this approach is time-consuming, the results of inadequately controlled and poorly implemented integrated data base systems can be unacceptable to any organization.

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He is responsible for DP auditing on a worldwide basis for all divisions of the company. Previously, he was manager of a DP control section and has held various programming positions in the company.

Krause holds a B.S. degree in computer science from Michigan State and an MBA from Southern Illinois University.



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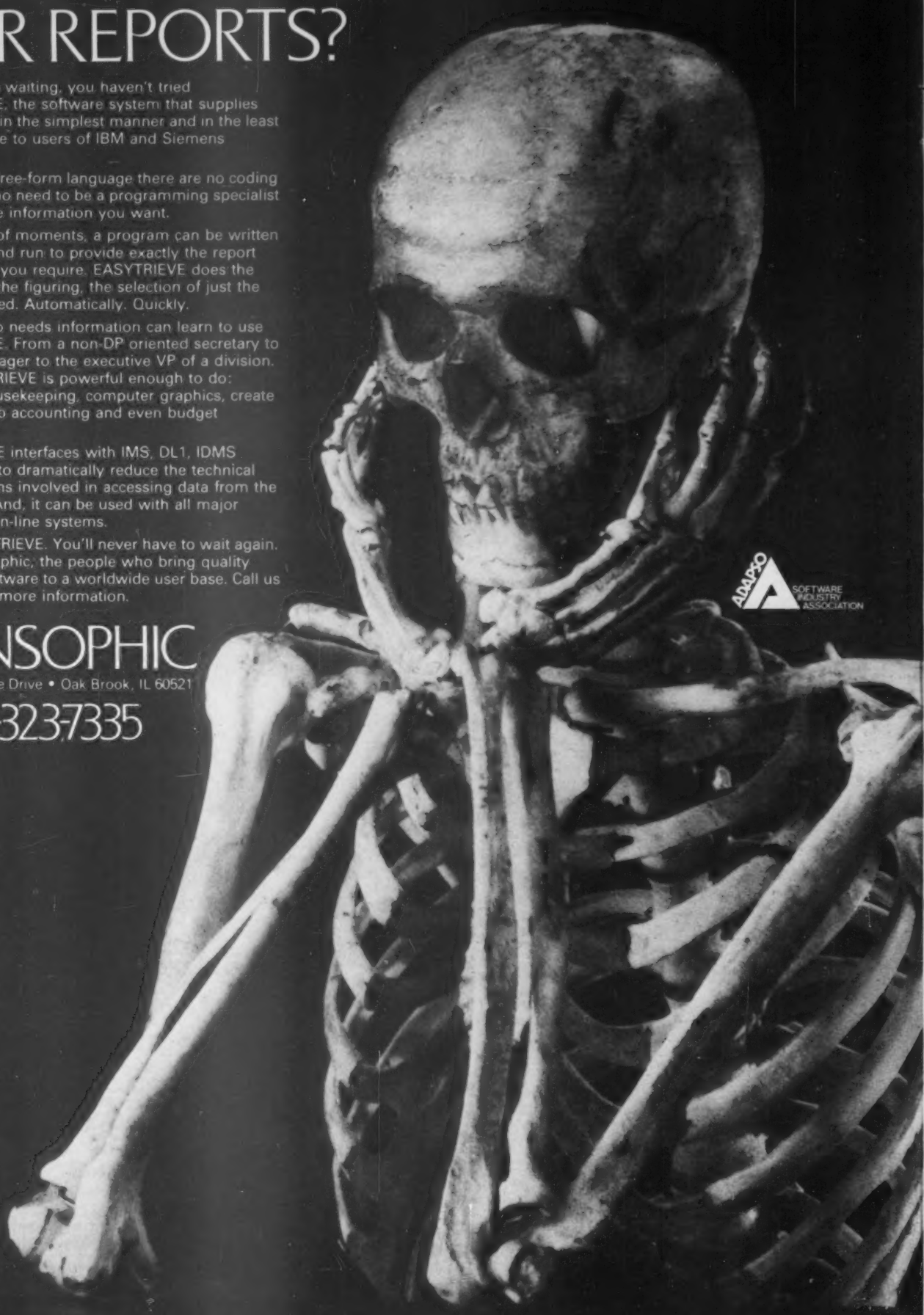
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Part 4: Survivability

SURVIVABLE SYSTEMS

The simple expedient of formally defining the process as the basic logical unit in a system, bounding its capabilities and then building an operating system that effectively manages such processes leads us to a powerful programming environment. We can now write multiuser applications that run in a multitasking, multiprocessor environment while concerning ourselves only with the problems of a single-user, single-thread application.

Equally important are the paths to all components; if one path fails, there must be an alternate path to that component. For instance, if the processor to which a user's terminal is connected fails and he has no means to be connected to another processor, then so far as he is concerned the system has failed.

This leads to the concept of dual-ported devices in which each device controller has two ports, each of

knows this. Therefore, interprocess messages containing data to be printed on the printer are routed to the printer I/O process in Processor A.

There are several failures that could cause this path to the printer to fail. Specifically, Processor A could fail, or logic in the printer controller port connected to Processor A could fail. In the former case, the operating system would realize the failure of Processor A and transfer ownership of the printer to Processor B; in the latter case, the printer I/O process would detect the fault in the controller and transfer ownership to Processor B.

In either event, subsequent interprocess printer messages are sent to the printer I/O process in Processor B. Therefore, providing the application

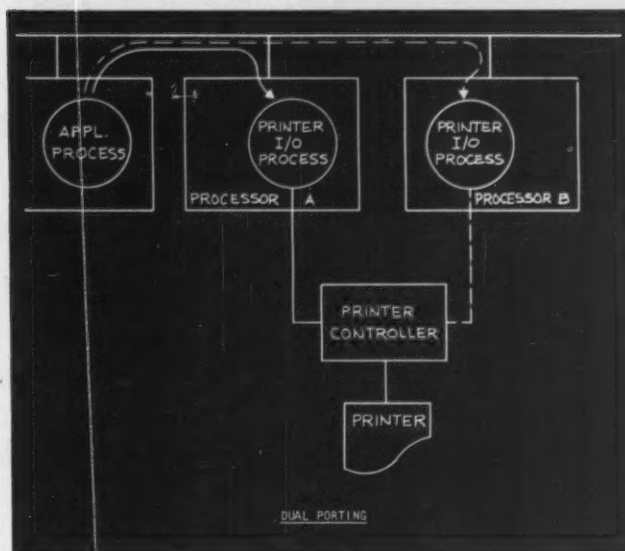


Figure 4-1

The multiprocessor aspect allows us a further extension of these capabilities. Since the system now has at least two processors, and since we have the option of adding two of anything else that might be critical, we have the opportunity to make the system highly fault-tolerant. We can create a system that will survive any single failure and many cases of multiple failures in that it will continue to perform functionally the same in the face of these failures. The user may notice a loss of capacity or responsiveness, but will not lose any of his capabilities. We will see that the structure and management of processes plays a big role in achieving this goal.

Hardware Duality

The first step in achieving survivability is hardware duality. If a critical hardware component fails, there must be another one that can be used im-

mediately. Equally important are the paths to all components; if one path fails, there must be an alternate path to that component. For instance, if the processor to which a user's terminal is connected fails and he has no means to be connected to another processor, then so far as he is concerned the system has failed.

As an example, Figure 4-1 shows a dual-ported printer. The printer (a normal, everyday, single-ported printer) is connected to a controller that can be driven either by Processor A or B via two independent ports. Each of these processors runs an I/O process which controls the printer via its connected port (remember that an I/O process must reside in the same processor to which the device is connected). Processor A currently owns the printer, and the operating system

This is the fourth installment in a five-part series.

process is written to reissue an I/O message in the event of an error, the failure of a processor or a device port is indeed transparent to the user insofar as his access to that device is concerned.

Unfortunately, in all devices there are simplex points of failure that will totally remove that device from service. For instance, the failure of a printer motor, or even common logic such as a line driver in the printer controller, will disable the printer. This can only be overcome by totally duplicating the device and its controller and making provision in the system for rerouting work away from the failed device to an alternate device. In the case of a printer, for instance, a sophisticated spooler would queue work for all printers on the system. If a printer failed, it would simply become unavailable to the spooler, which would continue to despool all work to the remaining printers. In many cases, the duplication of a device is not economically justifiable, and work for a failed device is simply held until the device once again becomes available.

There are two cases in which the continued operation of the device is every bit as important as the process-
(Continued on In Depth/10)

By Wilbur H. Highleyman

IN DEPTH

(Continued from In Depth/9)
sors themselves. One of these devices is the interprocessor bus; without it, all paths but local paths within a processor are lost. Therefore, this bus must be duplexed.

The other case is disk files containing critical data bases and system files (program and process images). If a disk containing one of these files goes down and there is no alternate, the system does down. Totally. Furthermore, just having a backup disk is not satisfactory. It must contain completely updated files; that is, it must be a mirror image of its partner. As data comes in that updates one disk of a "mirrored pair," it must also update the other disk.

Figure 4-2 shows the configuration for a mirrored disk pair. Three levels of mirroring may be used:

- One controller and two disks (Figure 4-2a). However, if logic common to both disks fails, then access to both disks is lost.

- One controller per disk (Figure 4-2b). No single failure will prevent access to the data.

- Dual-ported disk devices connected to dual-ported controllers (Figure 4-2c). This adds an additional level of redundancy to the mirrored pair.

There is an important utility that must be available to support mirrored files if they are to be truly effective — an on-line disk copy utility to be used when a disk that is part of a mirrored pair is to be returned to service. When a disk unit fails, the files are now being handled by a simplex disk. When the disk is repaired or replaced with a spare and is to be put back in the system, it must be brought back to its mirrored condition — that is, contain an exact copy of the other disk — even while further modifications are being received for that data. That is the job of the on-line disk copy utility — to copy one disk to another while at the same time ensuring that file updates are kept current.


To summarize hardware duality, Figure 4-3 (on In Depth/11) shows a simple system with a terminal, printer and mirrored disk pair. Figure 4-3a shows how these peripherals might be configured physically. Figure 4-3b shows the logical process configuration as it would interact with an application process. Primary paths are shown as solid lines, backup paths as dashed.

One final point should be made about hardware duality in a survivable system. Duality is fruitless if a failed device cannot be repaired and returned to service while the system is running (this led to the need of an on-line disk copy utility for mirrored files). Therefore, any piece of hardware — including processor, buses, device controllers, power supplies, even fans — must be capable of being removed, repaired or replaced and plugged back in while power is still on the system and without inducing "glitches" in the system operation.

Just as each hardware unit must have a backup, so must each software unit, or process. Should the processor in which a process is running fail, then that process will cease to exist (and the capabilities it provides will be lost to the user) unless a spare process can be "switched in."

Software Duality

(Continued on In Depth/11)



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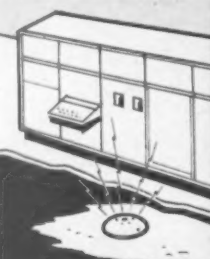
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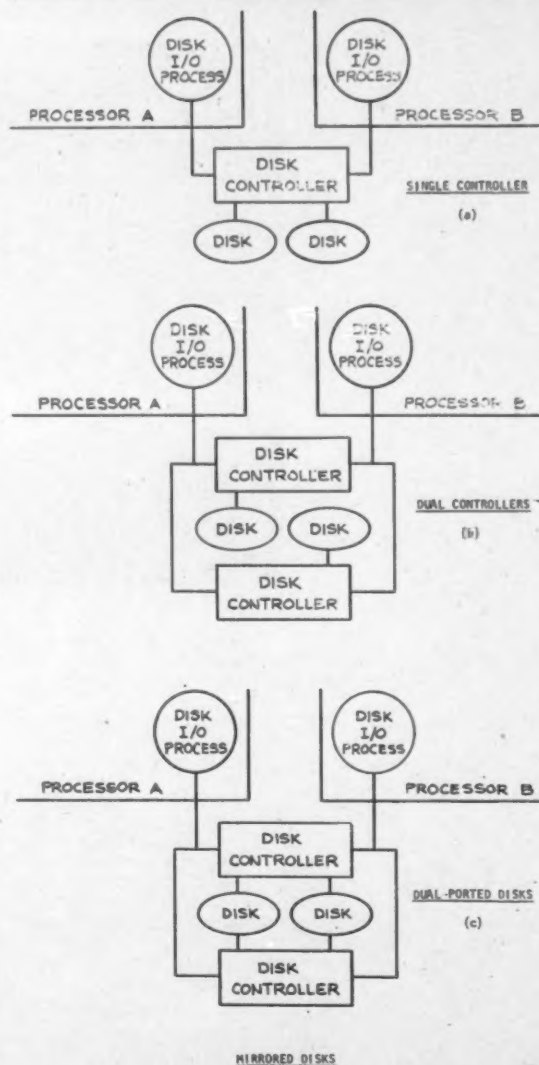


Figure 4-2

IN DEPTH

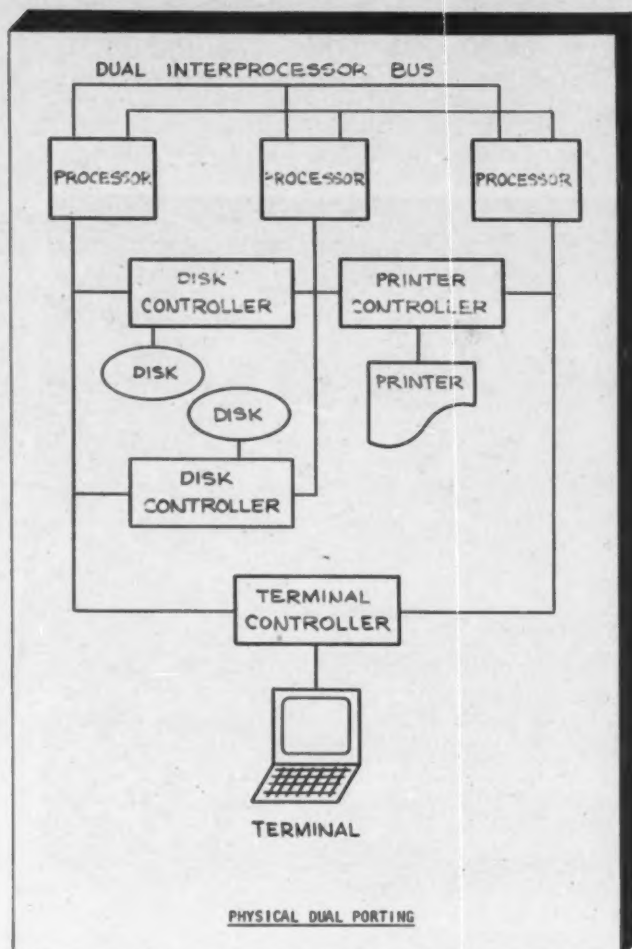


Figure 4-3a

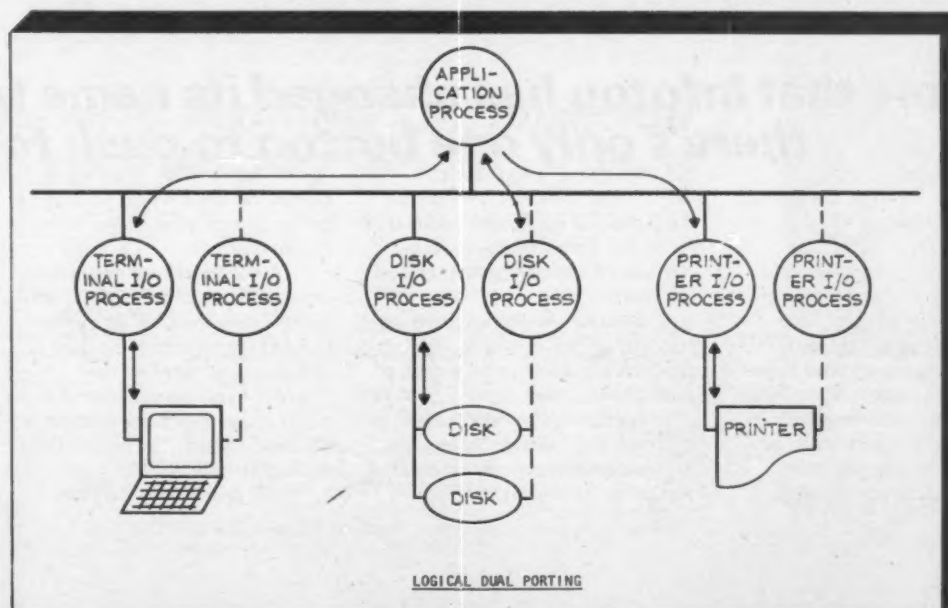


Figure 4-3b

PROCESS NAME	PRIMARY PROCESSOR	BACKUP PROCESSOR
INQUIRE	3	2
MAINT	2	
REPORTA	4	1
.		
.		
.		

Figure 4-4

(Continued from In Depth/10)

This requires two capabilities of the process:

- It must be able to create a backup copy of itself in another processor whenever it is created or has taken over from a failed process.
- It must be able to keep its backup informed of what it is currently doing (for instance, what transaction it is currently working on) so that the backup can continue its work uninterrupted should the primary process fail.

Backup Process Creation

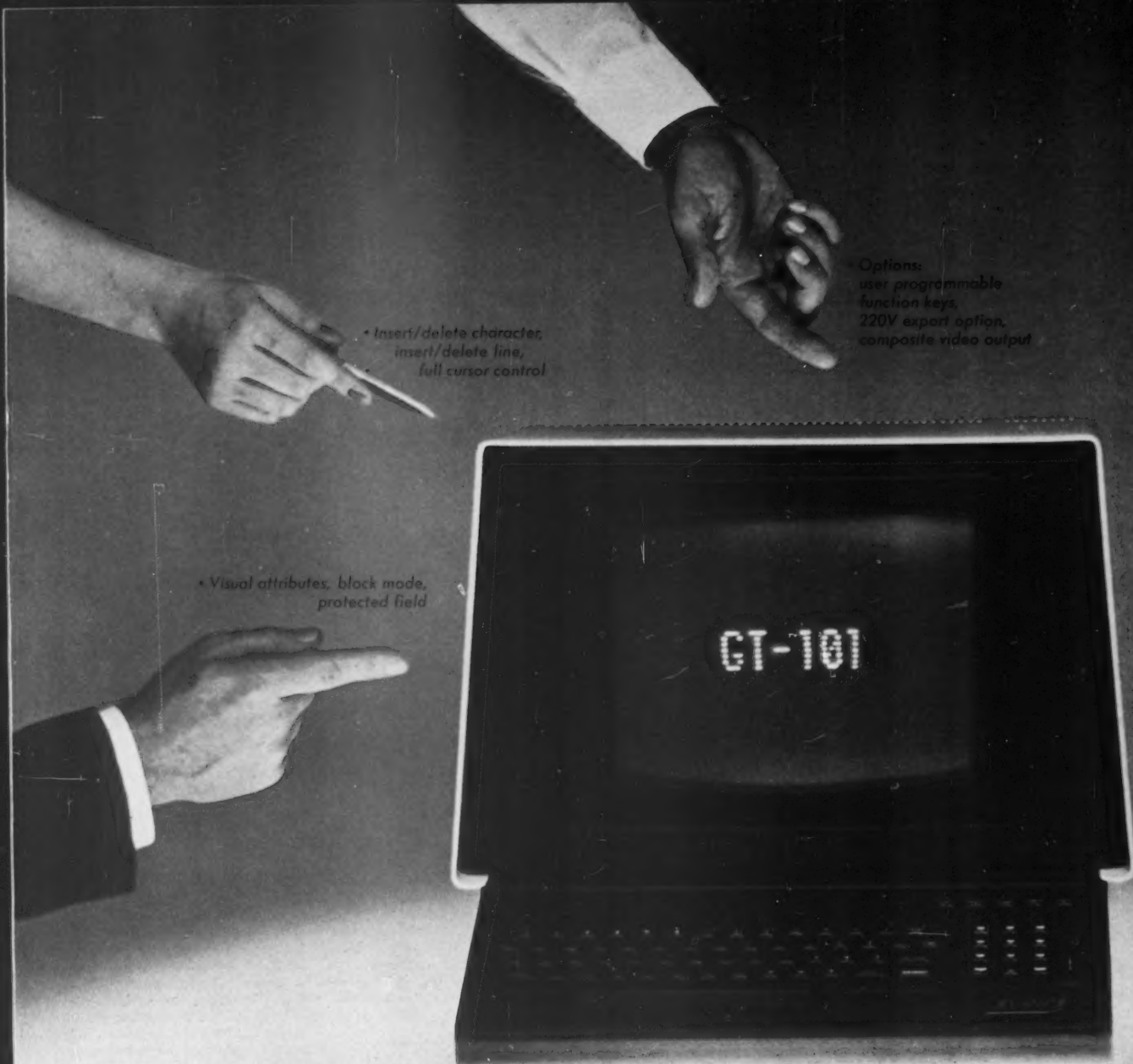
Let us first consider the creation and management of the backup process. Assume that Process A has been

created. One of the first things Process A does is to request the operating system to create a backup copy of itself in another processor; we will call this backup Process A'. It has the same name as Process A, but is created and runs in a different processor. A' detects that it is the backup (because it can sense that its brother already exists) and immediately calls a monitor procedure (Checkmonitor in the Tandem Computers, Inc. system) that is responsible for monitoring the primary process and taking over in the event of primary failure. The monitor procedure is provided by the operating system.

Just as the operating system must know of Process A so that it can route interprocess messages to it, so must it know about Process A'. As we discussed earlier, it knows about Process A and all other processes in the system via the process directory, a copy of which is maintained in each physical processor. Let us now extend the concept of the process directory to the process pair directory (PPD). The PPD contains the name of each process, the processor in which the primary is running and the processor in which the backup, if any, is running. Figure 4-4 shows a part of a typical PPD.

As Process A is performing its duties, the operating system routes all interprocess messages destined for Process A to it. However, should Process A fail (most likely because of a processor failure, but possibly because of a software fault that causes the operating system to abort it), the operating system will look in the PPD and find that Process A in fact had a backup. It will send Process A' what appears to be an interprocess message indicating the Process A has failed and the reason for its failure (processor failure, abort or whatever). This causes the operating system in the Process A' processor to

(Continued on In Depth/14)



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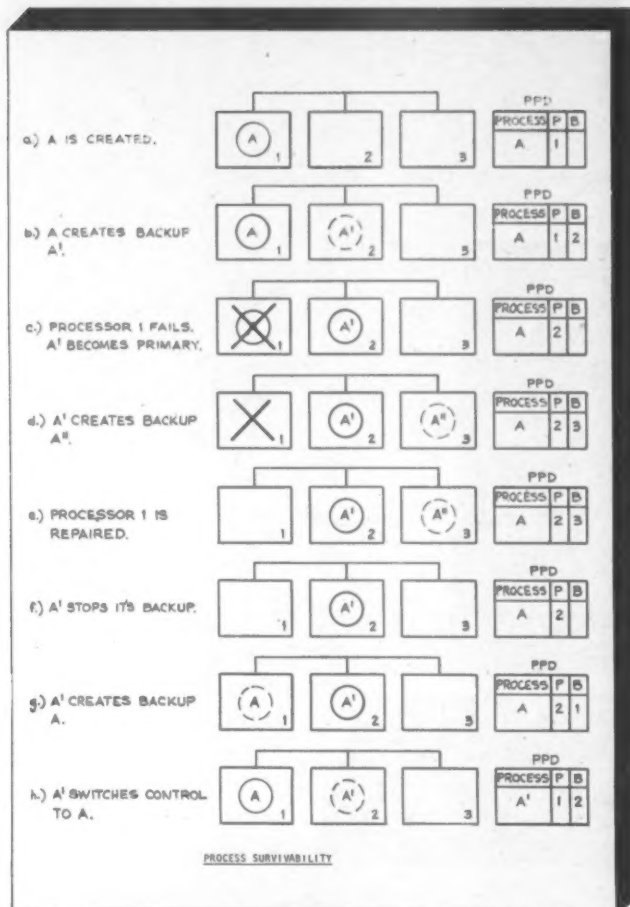


Figure 4-5

(Continued from In Depth/11)

schedule Process A' that is, put it on the ready list). Further interprocess messages for Process A are now routed to Process A' for processing, and the system survives. At this point, Process A' may create its backup to protect itself from further failure.

Figure 4-5 shows a typical life of a process in the presence of a processor failure. A three-CPU system is shown in which Process A is created in Processor 1; it creates its backup A' in Processor 2. Later, Processor 1 fails and Process A' takes over, creating its backup A'' in Processor 3. Subsequently, Processor 1 is repaired. The system could be left as is. However, in this case it is desired to reestablish load balancing. Therefore, Process A' stops its backup A'' and recreates a backup A in Processor 1. It then switches control to Process A, resetting the system to its initial configuration.

As can be seen, a variety of strategies can be employed to ensure system survival in a degrading system. Load sharing should be an important consideration in the strategy. The illustration has shown how a process can move itself from one processor to another by creating a backup in the new processor and then switching primary/backup roles. This capability could be used to dynamically balance the load in a multiprocessor system, either under operator control or under the influence of some monitoring process.

Checkpoint Messages

Having a backup process to switch to in case of a process failure is essential to surviving. However, if the system is to perform functionally the same in the event of a failure, the backup process must take over where the primary left off; this means it must know what the primary is doing.

Going back to our discussion of process structure, this is done quite simply as the result of one of the characteristics of the structure of a process. A process contains a code area and a data area. The data area comprises global data and a stack that is used to nest procedures, pass parameters between procedures and hold temporary data needed locally by a procedure. The state of a process is determined by the state of its data area; that is, give two like processes (two processes with the same code area) the same data area (and environment), and they will perform identical functions.

Therefore, if we could somehow maintain the data area of the backup process so that it is identical to the data area of the primary process, then if it started up following a primary process failure, it would behave exactly the same as if it were the primary process.

Unfortunately, the system load that would be imposed by constantly updating the backup's data area precludes such an approach. However, it is necessary only that the data areas be identical at certain critical points in the process's execution. For instance, if the data areas were made identical immediately following the receipt of a

transaction to process, then if the primary failed after partially processing the transaction, the backup would start at the point at which the transaction was received and would reprocess it. In many applications, this would be acceptable.

The backup's data area is updated via a mechanism called "checkpointing." This is simply an interprocess message sent by the primary process to its backup, the contents of which are the current contents of the data area. Like other interprocess messages, the receipt of this checkpoint message by the backup process causes it to be scheduled to run. As described previously, the backup process is executing the monitor procedure; this procedure will receive the checkpoint message and store it in its data area, thus updating the data area as desired. Updating the data area includes overwriting the stack.

But the monitor procedure is also using the stack, so doesn't this destroy that procedure? It would if the monitor procedure used the normal process stack. Therefore the monitor procedure must create a pseudo-stack outside the range of the process's data area, where it won't get overwritten. Since the monitor procedure is really part of the operating system, it can play this kind of game.

If Primary Fails

Should the primary process subsequently fail, the receipt of a system-generated message describing that failure (as described previously) will cause the monitor procedure to return to the main flow of the process at the last received checkpoint. That is to say, the backup process takes over and starts executing according to the last checkpoint.

But how does the monitor know specifically which instruction it is to start executing? The program counter is not part of the data area and is therefore not sent over as part of the checkpoint message. This is handled via the last stack marked in the stack in the data area. Each stack marked indicates the place at which the current procedure was called and causes the current procedure to return to the instruction following its call when it has completed. The stack marker also contains the processor environment to restore upon the procedure's return.

When a process wants to send a checkpoint message, it does so by calling an operating system procedure that takes care of actually issuing the interprocess message. Therefore, the last stack marker on the checkpointed stack was placed there as a result of the call to the checkpoint procedure, and it points to the instruction in the application program following the checkpoint call. When the monitor procedure wants to turn on the backup process, it simply executes a procedure return according to the last stack marker; that is, the backup process will turn on at the instruction following the checkpointed call, as if it were exiting the

(Continued on In Depth/16)

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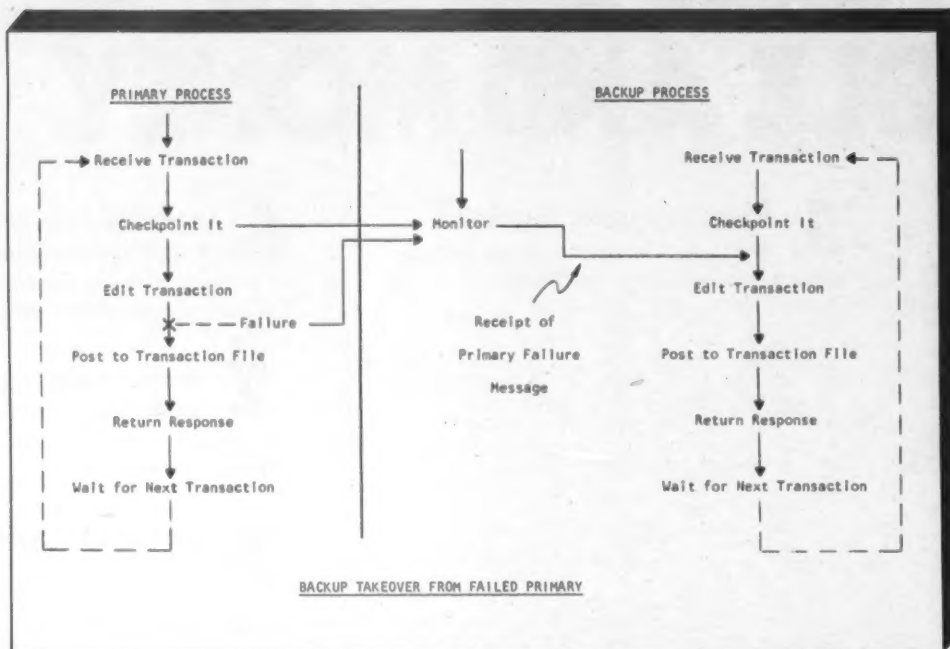


Figure 4-6

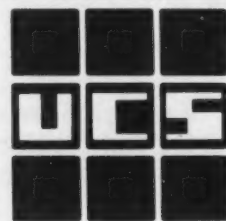
(Continued from In Depth/14) checkpoint procedure. This is illustrated in Figure 4-6.

The checkpoint procedure also returns with a status condition. This status condition normally indicates success when the primary process is running. However, if the backup process is turned on, the monitor procedure forces an error status that indicates that the primary failed and why. This allows the backup process to perform special takeover logic, should any be required.

In actual practice, it is usually not necessary to checkpoint the entire data area. The global data often contains a large data base, whereas the stack is typically small. Since large (multi-K-word) checkpoint messages would represent a large bus and processor load, it is advantageous to send over just that part of the data area that has changed since the last checkpoint. This often is simply certain elements of the global data plus the stack.

In some cases, it may not even be necessary to checkpoint the stack. If certain messages simply update internal parameters, it is necessary only to process the message, update those parameters and then checkpoint the changed data. In this case, the stack is

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not checkpointed, so backup processing would resume at the last point at which the stack was checkpointed, rather than at noncritical checkpoints.

Checkpoint Strategies

The basic concepts of survivable processes are quite straightforward — create backup processes and keep them informed at critical processing points via checkpoint messages. Checkpointing does represent a significant system load and should not be used casually. Checkpointing strategies should be carefully thought out in terms of minimizing the number of checkpoint messages and checkpoint lengths, while achieving the degree of fault transparency desired in the system.

More important, these strategies must be established as part of the design of the process. It is not sufficient to implement simplex processes initially without giving thought to survivability and then worry about where to put the checkpoints later. This can lead to a process organization in which the checkpointing task burden is so large it cannot realistically be carried.

Let us explore various levels of checkpointing. As we have said, the level of checkpointing should be commensurate with the level of fault

transparency desired. Consider an inquiry application in which the operator enters an inquiry, a file is searched and data is returned to him. In many situations, it may be quite reasonable to ask the operator to reenter the inquiry in the rare occurrence of a system fault that has interrupted the inquiry process. No checkpointing need be done at all; should the backup process find it has taken over, it might simply send a repeat request to all operators, not knowing which ones had active inquiries.

An even better situation is the above, but one in which the terminals buffer the inquiry and pass it to the system in response to a poll. In this case, the new primary process need only poll all terminals; those with unanswered inquiries would retransmit those inquiries for reprocessing. Full fault transparency has been achieved without checkpointing.

However, if it is not desirable to request the transaction again from the operator once it has been received, the process can checkpoint it as soon as it receives it and then process the inquiry. In this case, if the process fails, the backup has the transaction and will reprocess it without having to request it again. The operator will re-

ceive a response without ever knowing there was a fault.

In this case, if a failure occurred after the system had responded to the last inquiry and before it had obtained the next one, the response to the last inquiry would be retransmitted to the operator since the transaction is being totally reprocessed. If this is undesirable, a second checkpoint is required following the return of the inquiry response.

File Updates

Unfortunately, applications usually aren't this simple. Typically, a transaction is used to update a file. The simplest case of this is when the transaction is simply logged to a transaction file for later processing. In this case, all of the aforementioned strategies hold. If the operator or terminal can be requested to resubmit the transaction, no checkpointing is required. Otherwise, the transaction should be checkpointed when it is received.

In all of these cases, a failure could cause the transaction to be logged twice. Often, the processing programs can handle the case of duplicate transactions (transactions may carry serial numbers, for instance). If this is not tolerable, then (as above) the process

should checkpoint following the logging of the transaction to cause the backup to pick up at this point.

Often, however, the transaction is used to perform an on-line update of a file. In this case, a record must be read, modified according to the transaction and then rewritten. Whether or not the transaction was checkpointed when it was received, it is imperative that it and the record be checkpointed when the read of the record has been completed. Otherwise a double update could occur (unless this is allowed).

Consider a transaction that contains a count which is to be added to a field in a record. If the transaction is simply reprocessed following a failure, it would be added again to the field if the first transaction had completed. However, by checkpointing the read record and assuming a failure after the transaction had been completed, the backup process would continue from the point at which the read had completed. It would add the transaction count to the original field and return the record, overwriting identical data left behind by the primary process.

So far as transaction processing is concerned, this is the case of most general interest and is shown in Figure 4-
(Continued on In Depth/18)

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(Continued from In Depth/17)

7. The first checkpoint is needed only if the transaction cannot be requested again from the user. The middle checkpoint is needed only if a double update is not allowed. The last checkpoint is needed only if a repeat response cannot be tolerated.

Most processes, whether they deal with transaction processing, external event control, communication switching or whatever, can be framed as subsets of Figure 4-7. Therefore, we can see that the usual worst case for a transaction is three checkpoints.

It is important to minimize the number of checkpoints because of the system overhead they create. Sometimes no checkpoints are required. It is very often possible, and should be a general design goal, to design the system so that no more than one checkpoint per transaction is required. However, considerations to allow this often range throughout the system, from operating procedures (reentering a transaction) to terminals (block transmit, ignoring unexpected responses) to processing functions (detecting and ignoring duplicate transactions). Therefore, the determination of checkpoint strategies belongs in the very early stages of design and is not a candidate for afterthought.

Checkpointing Pitfalls

While the basic concepts of checkpointing are fairly straightforward, there are certain traps into which one can fall. We will mention a few here.

One obvious problem can occur if multiple processes are updating a single file in a checkpointed application. Keep in mind that a checkpoint follows the read of a record; assume that the checkpoint following the rewrite of the record is deemed unnecessary. Process A updates a given record. Shortly thereafter, Process B successfully adds other data to that record. Then, before it is asked to do anything else, Process A fails. Its backup resumes at the last checkpoint, reupdates the record (a copy of which was passed in the checkpoint message) and rewrites the record. This overwrites the record last written by Process B; Process B's update is lost. This occurs even though the file was properly locked during each update.

Checkpointing after the write can avoid this, but adds overhead. Therefore, it is often desirable to have a given file updated by a single process — the data base manager for that file.

Another problem is "windows." A window is a brief interval during which, if a fault should occur, data is lost or operation is indeterminate. One example of a window is a failure during operator entry from a nonbuffered terminal. Unless this data is being read by both processors connected to the terminal controller, this data will be lost. (Dual reading is a problem, since without read interprocess requests being received by the backup I/O process, it does not know when the last read became satisfied, thus establishing which data is currently active.)

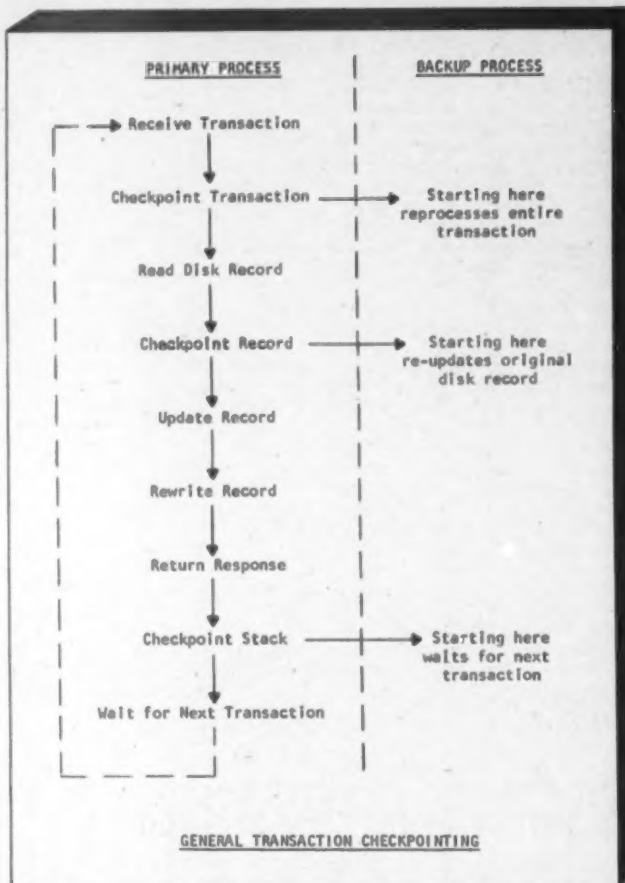


Figure 4-7

Lost operator data simply results in a degree of fault nontransparency. A more severe problem is a failure of a process during a disk write. When the backup takes over, it does not know if the disk write had not yet been initiated or had completed but the primary process had not yet checkpointed. If this operation were writing a record to the end of file, for instance, and the backup reissued the write, the record might be duplicated.

This problem can only be solved at the system level. Tandem solves it by carrying a synchronization count with each critical disk operation for each process.

Other critical situations that can exist at process failure time involve pending interprocess messages. There are several cases to consider. Let us define the "source process" as the originator of the message and the "destination process" as the recipient of the message. Consider the following cases:

- The source process sends a message and awaits a reply. It then notifies its backup via a checkpoint message that it has received a reply. What if the source process fails while it is waiting for the reply? Is the reply rerouted to the backup source process? If not, the backup source process will reissue the message, thus causing the destination

process to receive a duplicate message, which it must then recognize as such if duplicate processing is not to be allowed. (The protection against duplicate critical disk operations described above is such a case solved within Tandem's Guardian.)

- Several source processes have sent messages to a destination process. These messages have not yet been read by the destination process (they are still queued to it) when the destination process fails. Are they rerouted to the backup process? If not, this is a variation of the above case. The source processes must detect the failure of the destination process and reissue the messages.

The extension of a process to include the capability of creating its own backup and keeping its backup informed via checkpoint messages provides the capability for the programmer to easily build survivable processes in a multiprocessor environment. The system is made truly survivable by ensuring that there are dual paths to all peripheral devices and that all critical files are mirrored. Primary/backup role switching also allows load balancing to be accomplished dynamically in the system.

The proper strategy for checkpointing can be a difficult design task ranging across many considerations outside the realm of program design, including operational procedures and peripheral specifications. Once these are established, however, the implementation of the checkpointing strategy is little more than trivial. Particular care must be paid to lost and duplicate messages. Potentially, lost messages must be repeated, leading to the certainty of duplicate messages which must be detected and handled properly.

Next week: Throughput.



Dr. Wilbur H. Highleyman is president of Sombers Associates, Inc., Mountain Lakes, N.J., a firm specializing in minicomputer and microprocessor turnkey software. He is also chairman of MiniData Services, Inc., a service company.

Previously, Highleyman was responsible for Data Phone development at Bell Telephone Laboratories and was a cofounder of Data Trends, Inc. He has been instrumental in the design and implementation of survivable systems for the graphic arts, communications, financial and wagering industries.

Highleyman holds a B.E.E. degree from Rensselaer Polytechnic Institute, an S.M.E.E. degree from Massachusetts Polytechnic Institute and a D.E.E. degree from the Polytechnic Institute of Brooklyn. He holds four patents and has published extensively on pattern recognition, communications and business minicomputers.

LOOPS

And Firm Foundations

Fancy loops are not wrong, just unnecessary. Anything a fancy loop can do, a fundamental structure can do better, the author maintains.

By Roger House

"So much, at the primitive level, is commonly overlooked, and what is seen is normally recounted in a fashion so fragmentary as to be hardly coherent. The very act of dwelling for a while with even a simple form can evidently tax the whole of one's powers, so that to leave the simple forms before one is properly familiar with them can result in many unrewarding, or largely unrewarding, . . . excursions."

— G. Spencer-Brown
(from *Laws of Form*)

The data processing industry is in trouble. Millions of dollars and years of effort are spent to create unwieldy systems that are riddled with bugs and don't properly solve the problems they are intended to solve.

Much attention has been focused on why this is so, and one design method after another has been proposed to solve the problem, usually including some new form of diagram or chart with a hyphenated name. Many of these design methods are sound enough. In fact, most of them are based on the same two or three general principles dressed up in different costumes. But even when we use these new methods, we seem to have no difficulty creating bad to mediocre systems.

Why is this? I would like to suggest that one of the main reasons is that we fail to distinguish between what is fundamental and what is not. And even if we see what is fundamental, we apply it incorrectly or not at all. In short, we are in such a hurry to build grandiose, sophisticated products that we neglect the simple basics and end up with castles built on foundations of sand.

This article aims to illustrate this thesis in one area, namely the subject of loops, how they are not understood and the problems that arise from neglecting the basics.

Let's start with an example showing

how confusion about basics leads to needless irritation and waste, to say the least. In his recent book, *Structured Systems Development*, published by Yourdon Press, 1977, Kenneth T. Orr is asked about the behavior of a particular program when its input file is empty, that is, contains no records. Orr's reply: "I make sure that I don't call this program! Indeed, unless you simply enjoy watching the operating system grind away, I can't think of any good reason for executing a program with no data."

I find this to be a very peculiar statement. First, the issue is not one of "data" versus "no data." A file is a data structure, and if a program has a file as input, then it indeed has data to process. It may happen that the input file is empty, just as a numeric data item may have a value of zero. We don't say that a zero data item is "no data," and likewise we shouldn't say that an empty input file is "no data." Most likely, Orr meant to say, "I can't think of any good reason for executing a program with an empty input file."

But this statement is also troublesome. Continuing the analogy with zero data items, we conclude that it is a waste of CPU time to compute $A + B$ if either operand happens to be zero. The problem is that determining whether A or B is zero and, if so, not adding them is more bothersome and expensive than simply computing $A + B$ no matter what values they contain. I suggest that the same holds true for processing empty input files.

Practical Illustration

Here is a very down-to-earth, practical illustration of this. Say we have a system in which Program A is run periodically to check a master file for certain exceptions (see Figure 1). For each master file record that qualifies as an exception, some data is written to an Extract File E. After Program A terminates, Program B is run to process File E and print Report R for Jones, who takes care of the exceptions. Now, on rare occasions, Program A finds no exceptions, so File E is empty. Using Orr's suggestion, we should not run Program B because its input file is

empty.

You may have some questions at this point concerning who or what determines that E is empty, how this information is used to make sure B is not run since in the normal course of events B will be run and so forth. I leave these questions unanswered because they are second-order problems that will vanish as soon as we get rid of the underlying problem. To go on, let's continue playing out this scenario so that we see the real-life effects of not handling empty files.

When Jones arrives at work on Monday mornings, the first thing he does is take care of Report R, because the exceptions it lists are critical to the company's cash flow. One Monday morning, Report R is not on Jones' desk because File E was empty, and so Program B was not run, no Report R was printed and, of course, it was not distributed to Jones.

Well, Jones is very happy because he doesn't have to worry about his usual Monday morning headache of handling exceptions, right? Wrong! Jones immediately calls operations to find out why Report R is missing. Operations pleads innocent, but begins a search. Meanwhile, Jones' supervisor is on his back because information from Report R is needed for the weekly production meeting. Need I go on?

Now, let's consider a second scenario, one resulting from observing a different rule: A program will always process an empty input file in an appropriate manner (which generally means an empty input file is processed just as one that is not empty). Jones arrives one Monday morning and finds Report R on his desk. This Monday, Report R is "empty"; it consists of one page with titles, no detail lines and a summary indicating zero exceptions found. Jones smiles, files the report and phones his supervisor to let her know there are no exceptions to handle in the weekly production meeting. Of which scenario would you rather be a part?

What led to Orr's statement about empty files? My guess is that this
(Continued on In Depth/20)

IN DEPTH

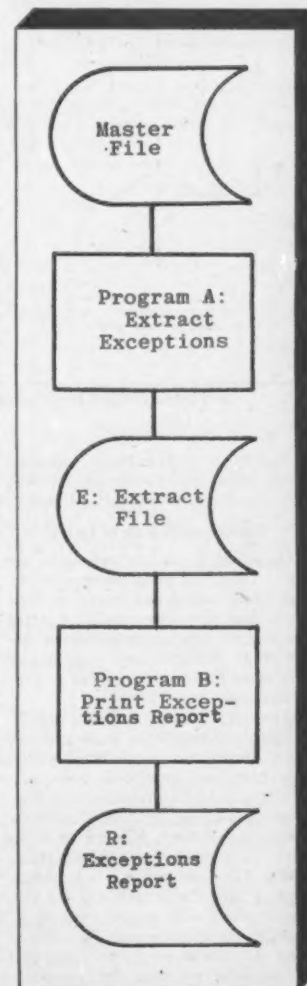


Figure 1. An Exceptions Report

IN DEPTH

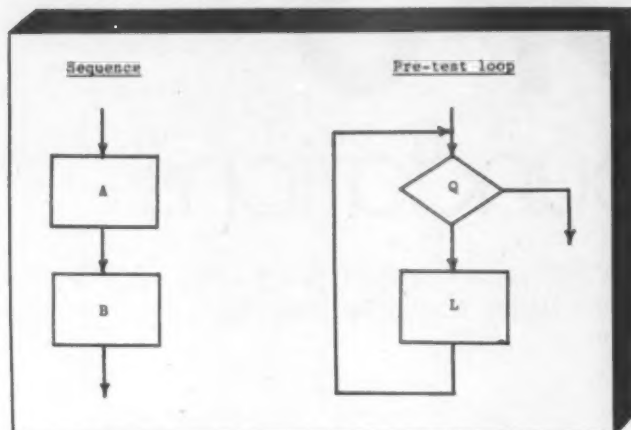


Figure 2. Control Patterns Sufficient for All Programming

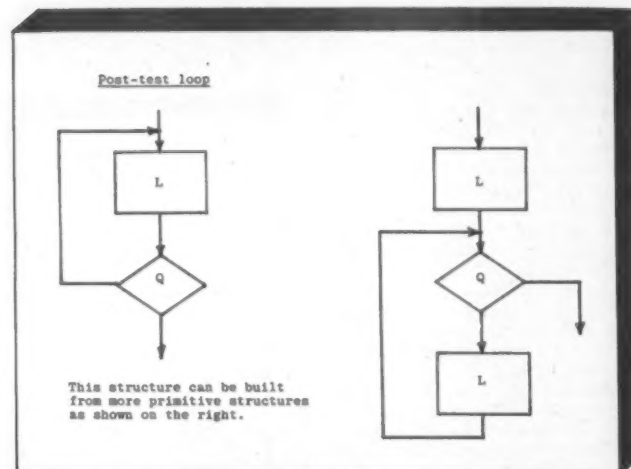


Figure 4. Posttest Loop Using Sequence and a Pretest Loop

(Continued from In Depth/19)
statement is a result of confusion about basic loop structures. We will return to this after discussing loops.

Fundamental Role of Loops

The ability to execute loops is the basis of computer programming. Without loops, computers would be little more than toys; they would be useful for very few practical applications. After some thought, any programmer will agree that loops are basic to programming.

However, in 1966, C. Bohm and G. Jacopini, showed that loops play an even deeper and more fundamental role than had previously been suspected ("Flow Diagrams, Turing Machines and Languages With Only Two Formation Rules," *Classics in Software Engineering*, Yourdon Press, 1979). They showed that a particular type of loop, the pretest loop (see Figure 2), along with sequence, are sufficient to do all programming whatsoever. (Of course, we should rigorously define what we mean by "programming" before making such a statement, but for our purposes it suffices to say that "programming" covers any code we might write in Algol, Basic,

Cobol, Fortran, Pascal, PL/I, and so forth.) Since structured programming has been the burning issue of the day for some time now, most programmers have at least a vague idea that a limited number of control patterns suffice to do all programming. However, very few seem to appreciate how really astonishing it is that the almost trivial structures of sequence and pretest loop are powerful enough to implement any function we have coded over the last 20 years or so.

Sufficient Not Always Enough

In the realm of hardware, it is well known that a single Boolean function is sufficient for implementing all other Boolean functions such as AND, OR, NOT and so on. However, for many reasons, it turns out to be more practical and convenient to use AND, OR and NOT as primitives in the design of circuits, instead of one single basic function. Likewise, when it comes to programming, it is very convenient to add at least one more structure to the basics, namely selection.

However, don't be misled. Selection is not a basic structure. Anything that can be done using selection can also be done without it because selection can

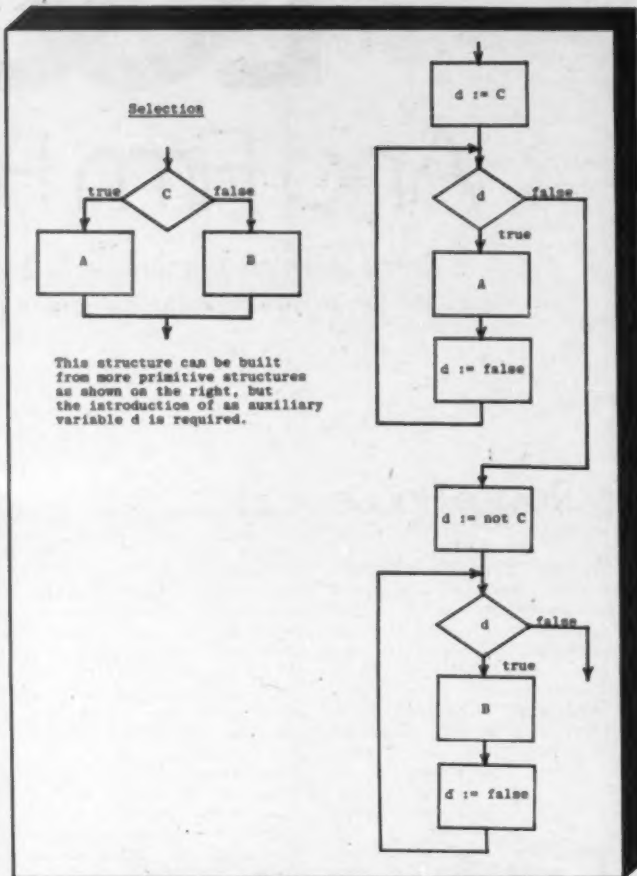


Figure 3. Selection Using Sequence and Pretest Loops

be implemented using sequence and pretest loops as shown in Figure 3. Examination of Figure 3 shows why we want selection as one of our building blocks; it is simply too awkward to implement selection using sequence and pretest looping. Since selection is a very common structure in programming, we add it to our set of control patterns.

Another situation occurs now and then in programming, namely the need to perform a loop which has a test at the end instead of the beginning. Such loops are called posttest loops and, again, we don't need them because they can always be implemented by using sequence and a pretest loop as shown in Figure 4. However, as for selection, we may want to add posttest loops to our repertoire of control patterns, simply for convenience.

Messing Up Something Simple

So far we have been looking at control structures represented as flowcharts. Ultimately, however, we are interested in writing source code using the control structures, and so we need some sort of syntax for expressing them. Traditionally pretest loops have been represented along the lines of:

```
while Q do
  L
endwhile
```

and posttest loops have been represented as:

```
repeat
  L
until Q
```

There are currently no universally followed standards for representing control structures in pseudocode, and thus some conventions use `do while Q` instead of `while Q do`, but the control structure is the same even though it may be represented in different ways.

Unfortunately, the issue of the syntax of pretest loops and posttest loops has led to a really embarrassing situation; there is a widespread assumption that `while` implies pretest and `until` implies posttest. If you gain nothing else from this article, please remember one thing: The use of `while` or `until` in a loop has absolutely nothing whatsoever to do with whether the loop is a pretest loop or a posttest loop. The use of `while` indicates that the loop should be executed as long as some logical expression has the value true. The use of `until` indicates that the loop should be executed as long as some logical expression has the value false. See Figure 5.

Of course, we can get by with using only `while` or only `until`. For example, `until Q` can always be written as `while not Q` do. However, it is clearer and less confusing to think of `until`

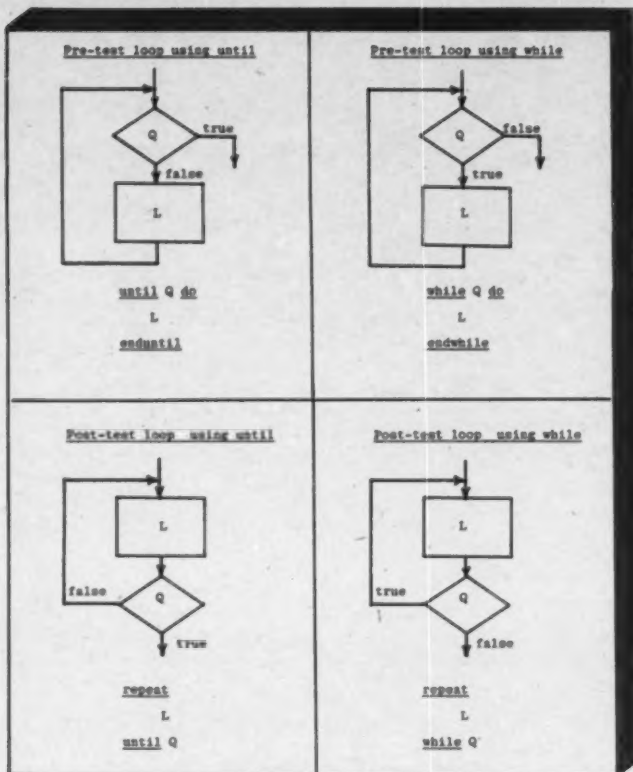


Figure 5. Representing Loops in Pseudocode

end of file do rather than while not end of file do, so why not furnish the programmer with both while and until so that the intended logic can be expressed as naturally as possible? Figure 5 shows both pretest and posttest loops, each using both while and until.

There are two issues here, the first being what logical value to use to terminate a loop (while or until) and the second being where to place the loop test (pretest or posttest). These two issues are quite separate; they have nothing to do with one another. So how has it happened that they have become confused? I don't know the answer to this question, so I can only speculate. One possible source of the confusion might be that Pascal uses while for pretest loops and until for posttest loops. As the use of Pascal has spread, the association of while with pretest and until with posttest may have become fixed in people's minds.

However, this still does not answer the question, it just raises another one: Why would the association arise in people's minds? Perhaps the answer is that we humans seem to have a deep-seated predilection for avoiding simple, straightforward thinking. We will design a new programming language before spending 10 minutes contemplating a simple but fundamental principle in a common-sense fashion.

There are nasty consequences of this failure to deal with basics. Following is an example of the needless confusion and chaos that result from sloppy thinking which lumps two indepen-

dent issues together.

Mutilating a Language

Standard PL/I has long contained the following construct:

```
DO WHILE (Q);
  L
END;
```

This is precisely the pretest loop using while, and it is to the credit of those who designed PL/I that they included this fundamental construct in the language. Recently some versions of PL/I were extended by adding a statement of the following form:

```
DO UNTIL (Q);
  L
END;
```

Obviously, this is the pretest loop using until. Obviously? Well, it should be the pretest loop using until, but, in fact, it represents the posttest loop using until.

The new addition to PL/I breaks a fundamental rule of design: Form should follow function. In the area of programming languages, this rule might be formulated as, "Syntax should reflect semantics." In other words, the form of a statement, its syntax, should reflect the meaning of the statement, its semantics. The DO WHILE and DO UNTIL statements described above have similar form, and anyone with a modicum of ordinary common sense will assume that they have similar meaning. If DO WHILE is a pretest loop, then clearly DO UNTIL should also be a pretest loop. That DO UNTIL is a posttest loop will sim-

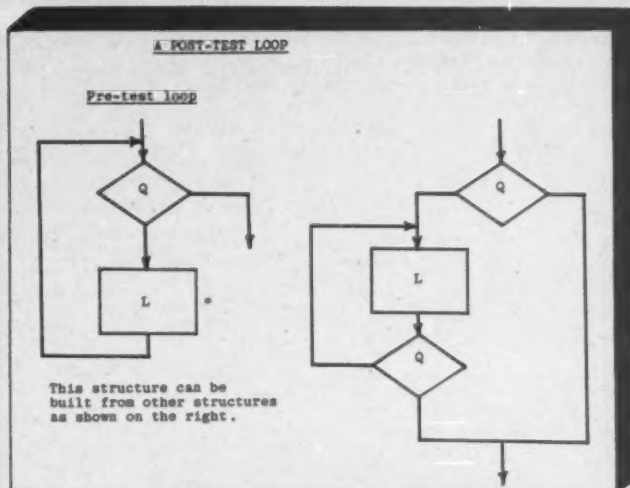


Figure 6. Pretest Loop Using Selection and a Posttest Loop

ply lead to misunderstandings, bugs in programs, wasted dollars and perhaps even property destruction and loss of life.

Every new crop of trainees learning PL/I will be drilled on these two loops over and over again to pound their common sense assumptions out of them. Most of the trainees will assume there is some good reason the two loops look alike but behave differently; after all, computers and programming are so complicated that the trainee only hopes to understand someday the subtle reasoning behind things.

Anyone teaching these loops will do the trainees a great service by explaining to them that the similarity of form and difference in meaning are simply the result of muddled, half-baked thinking. Better yet, do not teach this mess to anyone. Teach DO WHILE and never mention DO UNTIL.

In the foregoing discussion I am not railing against the use of posttest loops, but against confusing ways of representing them. A posttest loop, as the name implies, results in evaluating a logical expression at the end of a loop, and thus reason dictates that the syntax place the test at the end of the loop. (By the way, when the test is written at the end of the loop, it is also easier for compilers to handle the construct.)

If you feel that the new DO UNTIL statement in PL/I may be a bit awkward, but can be lived with, consider how to add the pretest until loop and the posttest while loop to PL/I (see Figure 5).

Back to Empty Files

Now it's time to go back to the question of what led to Orr's statement about processing empty files. Of course I am speculating, but I think this statement came directly out of Orr's choice of basic control structures. Orr chose the posttest until loop as the means for achieving repetition and, as a result, a program that handles empty files requires an explicit test to

check if the file is empty. In effect, a pretest loop is implemented using selection and a posttest loop (see Figure 6). Implementing pretest loops in this way is a bit awkward and clumsy, so it is nice to know that the input file always contains at least one record so that the test for an empty file can be omitted. Ergo, Orr's statement.

If Orr had chosen the pretest loop as the means for achieving repetition, he would never have had any reason for making his statement and, in addition, he could have omitted six or seven pages of dubious argument from his book. So, why didn't Orr choose the pretest loop? Possibly because when he made his choice he didn't stop to consider which loop is more fundamental. Using sequence and pretest loops, we can construct selection and posttest loops. However, we cannot construct selection and pretest loops from sequence and posttest loops. Thus, pretest is more fundamental than posttest and clearly should be in our set of basic control structures. Of course, there is no reason we shouldn't have both pretest and posttest loops in our repertoire, but if we only choose one, let it be the most basic loop.

The lesson is that some thought about fundamentals can save us a lot of needless confusion, awkwardness and bother.

Fancy Loops

Designers of programming languages seem to vie with one another to see who can come up with the fanciest loop structures; for an example, study all the options and defaults available in the DO loop of PL/I. There is nothing inherently wrong with fancy loops, as long as we realize that the fancy loops are unnecessary in that they can be implemented with the fundamental structures.

For example, consider this Fortran DO loop:

```
DO 99 I = 1, 15, 2
  loop body
99 CONTINUE
```

(Continued on In Depth/23)

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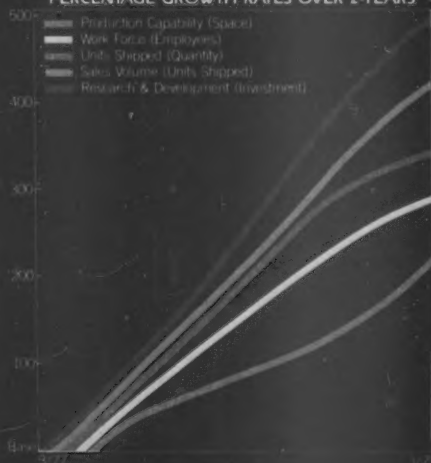
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(Continued from In Depth/21)

Using the pretest **until** loop, the same effect is achieved by:

```
1 = 1
UNTIL 1 15 DO
loop body
1 = 1 + 2
ENDUNTIL
```

This is not to advocate that we do away with fancy loops like **DO** (or **PERFORM VARYING**) which implicitly initialize, increment and test variables. Such loops are useful in that they succinctly represent commonly occurring sequences of operations, and they can often be compiled into very small chunks of object code which run very fast. However, let's be sure to have the basics in our languages, to define the fancy stuff in terms of the basics and to know the difference between what is basic and what is not basic but is built up from basics.

This latter point is crucial. When the basics are not provided in the language, we are hamstrung, attempting to build cathedrals with the latest in advanced technological tools but no mortar. The next section describes a case of missing mortar.

'When Will We Ever Learn'

Recently a new standard for Fortran was adopted, informally known as Fortran 77 (see *Communications of the Association for Computing Machinery*, Volume 21, No. 10, October 1978). Since the ideas of structured programming and control structures have been widely discussed and publicized for nearly a decade, one would assume that the new Fortran would incorporate some of these ideas. Indeed, the standards committee did add the general selection construct (**IF-THEN-ELSE**) to Fortran, only some 20 years after the birth of the language.

Unfortunately, and almost beyond belief, Fortran 77 does not contain the basic, fundamental loop structure. There is a loop structure, of course, a cleaned up, more useful version of the **DO** loop. But what if I want to write the Fortran 77 equivalent of:

```
while Q do
L
endwhile
```

Too bad. There is no loop in Fortran 77 that terminates when a logical ex-

pression becomes true or false. Of course, by using **GOTO** or by twisting and turning the **DO** loop in an unnatural and undesirable way, it is possible to implement pre- and posttest loops. But this is true of Fortran 66, the old original Fortran of the 1950's, as well as the most primitive Basic.

When you think about the work, the effort and the time that goes into standardization, it is very sad that one of the two basic structures of programming is omitted from the language.

Reason: Failure to look at what is fundamental and a failure to recognize that the pretest loop is basic, that it is possible to build any kind of fancy loop from the basics, but not vice versa. We need to understand the difference between what is fundamental and what is simply a collection of frills tacked on to the fundamentals!

Good Tools Not Enough

Of course, simply having the basics available is not a guarantee that every-

thing will then proceed as if on greased wheels. A casual look at many so-called "structured" programs reveals that good tools can be used to write poor code. Here is a typical example of the logic used to process a sequential file as found in many articles and books purporting to show the reader how to write structured code:

```
MOVE FALSE TO EOF-FLAG.
PERFORM RECORD-LOOP UNTIL
EOF.
```

(Continued on In Depth/24)

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IN DEPTH

(Continued from In Depth/23)
RECORD—LOOP.
READ FILE-A AT END

MOVE TRUE TO EOF-FLAG.
IF NOT EOF THEN
process record.

This is structured; it uses a pretest loop; isn't it a sterling example of good code? No. It is clumsy and awkward. In addition, it violates a good programming practice which has been in use since long before "structured" became a hot item, namely the READ of a file

should be isolated in a module so that there is only one READ statement per input file. Why? Simply because at some point it will be necessary to count the input records, sequence check them or something or other, which will be much easier to do if there is only one place in the program where the file is read.

So the first step in cleaning up the code is to define a module to read records:

READ-FILE-A.

READ FILE-A AT END

MOVE TRUE TO EOF-FLAG.

The next step is to clean up the loop:

MOVE FALSE TO EOF-FLAG.

PERFORM READ-FILE-A.

PERFORM RECORD-LOOP UNTIL
EOF.

RECORD—LOOP.

process record.

PERFORM READ-FILE-A.

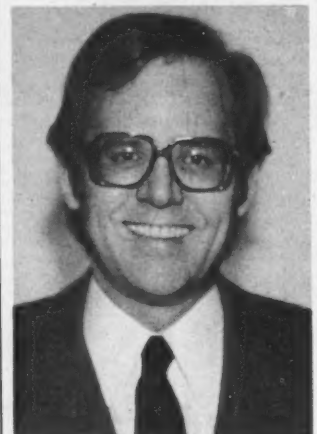
This logic reads the file to get the first record (if any) and then enters the

loop. We will, in fact, only enter the loop if we have a record to process, in which case we process it, and then, as the last action in the loop body, we read the next record (if any), loop back and process the next record and so on. When the logic is arranged so that the loop is only entered when there is a record to process, life is much simpler. The action of the loop body is, "Process the current record and then read the next record."

Note that if the input file happens to be empty, the code functions properly. We need no special tests to see if the file is empty, no special cases or special code. This is as it should be. A good, general solution handles so-called "special cases" automatically as part of the general case.

Considering the examples we've seen, is it any wonder we are beginning to see articles with titles like "Has the Structured Revolution Failed"? If we really get down to the root of our problems, we might start seeing headlines like "Failure to Apply Fundamentals: A Problem in DP Industry?" My aim has been to suggest that a modest understanding of theory, a knowledge of what control structures are and which ones are fundamental and a modicum — just a milligram — of thought can save us much unnecessary confusion and expense.

Acknowledgements: I would like to thank William Elbring and Gerald Weinberg for many useful comments on an earlier version of this article.



Roger House began his career in 1963, working in Copenhagen on a Cobol compiler for the Siemens 3003. He has also contributed to the Advanced Research Projects Agency project at the University of California, Berkeley, and built a plaintext-to-Braille translator for KVAL, a Stockholm-based linguistic research group.

As a consultant, House has developed Cobol compilers, RPG interpreters, information retrieval systems, circuit simulation compilers and business systems. For the past six years, he has conducted Brandon Systems Institute's workshops in structured techniques.

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It's There — It Just Costs More Users: Shortage? What Paper Shortage?

By Jay Woodruff
and Ann Dooley
CW Staff

While users are not experiencing problems getting paper supplies — as long as they are willing to pay the price — many are now finding ways to use less paper in their daily operations.

At least that's the conclusion that can be drawn from a recent *Computerworld* survey of users.

None of the 26 users surveyed have failed to meet their DP schedules for lack of paper, although many said they have heard rumors of a shortage. Only two users actually experienced problems getting paper supplies, but

respondents generally agreed that it does take longer to get them.

"We've questioned the vendors and they foresee no problem. They have been stocking three months ahead," Herb Robinson, division manager and vice-president of operations at Wester Bankcorp. in Tempe, Ariz., said.

About 30% of users surveyed are using more paper than last year, which may have caused suppliers to lag behind the demand. About 38% are using the same amount of paper as last year, and only one user has actually cut paper consumption.

"The current situation is a seller's market," according to Brent Williams, purchasing

agent for the First National Bank of Oregon. "It takes a little longer to get custom forms, and for a large request, the forms people have to special-order."

"There certainly is no shortage of raw materials," he added, a change from last year when West Coast paper strikes threatened supplies [CW, Jan. 15, 1979].

User Strategies

Only two users said they can still get paper in a few days or less, while two more said they generally order a month in advance. Others keep a 90-day supply on hand, while a few users now maintain — either on-site or at vendor premises — a year's supply of paper.

Some users who could get rapid delivery over a year ago now hold one-year supply contracts to guarantee they will get what they need.

Other users admitted they were not aware of any change in ordering policies because their orders are handled by separate purchasing departments — which have not signaled users of trouble in filling their orders.

Of the two firms that reported encountering serious problems getting paper, one is still having a lot of trouble, and the second now worries only occasionally about spot shortages.

A Fort Worth, Texas-based firm that asked not to be identified has had a "heck of a battle" getting paper forms supplies, a spokesman said. He expressed hope that the situa-

(Continued on Page 52)

System at Metropolitan Life Handles 50,000 Claims Daily

UTICA, N.Y. — An on-line insurance claims system serving 300,000 employees has reportedly quickened turnaround, lowered costs, reduced paperwork and added claims-processing flexibility here at Metropolitan Life Insurance Co.

Designed to process 50,000 claims a day when fully implemented, Metropolitan's Unified Claims System is presently operational for vision care alone under the firm's Medimet plan. It has been handling employees from the aluminum, automobile, can, coal, steel industries who are covered for eye examination, frame and lens charges. The current volume of the system, which started up in early 1979, is about 8,500 claims a week.

Based on an IBM 370/168 and 3033 main-frame in Greenville, S.C., to which IBM 3270 CRT terminals are linked over telephone lines, the system provides three major on-line, real-time capabilities: data entry of claims, file update and inquiry.

Data on employee eligibility, provider verification and charges, as well as patient history and reasonable or customary fees, is stored in the computers' master files, accessible by the 3270s. The Unified Claims System also has a plan master file, a preprogrammed plan design with specifics to "tailor" the system to a particular group, according to Project Manager Ajay Mithal.

"It drives the whole system, helping us customize without reprogramming," Mithal

said. "If a customer wants the company address printed on the benefits statement sent to the employees, for example, that data is stored on the plan master file."

Claims processing in Utica starts with incoming mail — claims forms and attachments sent by providers (such as ophthalmologists, optometrists and opticians), employers and employees. Each case is microfilmed and assigned a unique identifying control number: a worksheet is then prepared. Cases then move to a 3270 data entry

(Continued on Page 52)

Miniconference, Seminar Set For Data Entry Professionals

STAMFORD, Conn. — A miniconference and seminar on "The Improvement of Data Entry Productivity and Distributed Data Entry" have been scheduled for Palm Springs, Calif., on April 15-17 and New York City on June 2-4 by the Data Entry Management Association (Dema).

The day-and-a-half miniconference in both locations will feature speakers and workshops designed to help data entry professionals improve management skills, keep pace with technology, in-

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Attendees can choose one of two day-and-a-half seminars on "How to Improve Data Entry Productivity" or "Distributed Data Entry/The Automated Office."

Attendees can register for both the miniconference and a seminar (three days) or either one. The fee for the miniconference is \$195; by paying that fee, attendees can automatically join Dema. The seminar fee is \$250.

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SYSTEMS & PERIPHERALS

On-Line System Handles 50,000 Claims Daily

(Continued from Page 51)
station for keyboarding of group, employee number and basic claim data.

From this point, the claim is completely monitored by the Unified Claims System at each stage of processing. Mithal explained. In addition to checking the eligibility of the claimant and provisions of the contract for a particular group, it makes sure the service was performed by an eligible provider.

The system also checks for

duplicate bills and limitations on benefits, matches charges against reasonable and customary amounts and calculates the benefits to be paid.

"The system highlights variations from the norm," Charles Lanigan, vice-president of group insurance marketing, observed. "Let's say a provider who usually charges \$17 for an exam sends in a charge of \$25 for the service. The computer will immediately spot this change and a correction will be made before

the provider is paid."

If the claim meets all criteria at data entry as far as needed information and requirements go, it is processed by the computer. At any time, however, the data entry operator can change the original input or suspend the claim for later action.

For example, a claimant may appear not to be covered because the latest eligibility information has not been entered in the data base. After updating the data base the operator can recall the suspended claim for processing.

Thanks to the "suspend" file, no claim is ever lost. "Once entered into the sus-

pend file, the claim can be reviewed at any time. Anyone can inquire into outstanding claims and learn how old they are," according to John Falzon, vice-president of group corporate staff.

Once a claim is processed — either closed out and paid or delayed for further information from the policyholder — it goes to nightly batch processing.

The computer puts out an explanation of benefits for the employer and employee, writes checks for the provider or employee, generates any letters needed to request more information from the policyholder and provides an ab-

stract for Metropolitan.

Participating providers get bulk payments, normally twice a month, with a single check covering all claims for the period and a summary statement of each claim showing the amounts charged, covered expenses and benefits payable.

Payments in One Week

The Unified Claims System goes through the entire cycle for a claim in about three fewer days than the system previously used. "We pay 95% of the claims within a week with much greater accuracy and control," Mithal said.

One of the major benefits of the system, according to Mithal, is that "the system is flexible enough to add almost any kind of group and plan provision on short notice."

The network will soon be extended to include the entire Metropolitan system of claims, regional and corporate offices. When dental coverage is added, 600 CRT terminals will be on-line to the system.

Within one to two years, the system will be complete for vision care, dental and medical coverage, with 1,000 CRT terminals in a nationwide network.

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Users Finding Ways To Conserve Paper

(Continued from Page 51)
tion would be temporary.

Nevertheless, he conceded that while paper was hard to get for six or eight months, "we never ran out."

Rohr Industries, Inc. is an aerospace subcontractor that began to feel a paper pinch last July, according to its general supervisor of data center control, Jim Pere. "We used to get a couple of days' turnover on our forms orders, but now we maintain a 30-day emergency supply," he said.

The Rohr DP shop and others indicated it frequently found it necessary to contact a number of vendors in order to fill its orders for continuous forms.

Cutting Consumption

Users on the whole are taking steps to cut their paper consumption — not for fear that paper will be hard to get, but because they worry about paper's steady climb up the price ladder.

Nearly all of those who said their paper use has not increased directly attributed that accomplishment to their substitution of computer output microfilm (COM) and other paper-reducing aids.

The survey found COM by far the most popular means of cutting paper use, with 42% of the 26 respondents using it. Some of those who registered an increase in paper use said the increase would be even larger without COM.

To cut consumption, three other users increased their use of interactive programming. Three more tried carbonless forms to save the cost of carbon sheets, but dropped them after a short time because they found them unsatisfactory.

Among other paper-saving "tricks" cited by respondents were printing on both sides of the paper, mostly for dumps and developmental program-

ming, increasing communications over CRT terminals and printing 8 line/in. instead of 6 line/in.

IBM and Xerox Corp. laser printers, especially those that print on two sides and print forms simultaneously with reports, have been purchased or considered by a number of users. One user has tried using lower grade paper for printing reports.

Microfiche Strategy

James Lake, senior vice-president of First International Bank in Dallas, mirrored other user comments when he said that "microfiche is part of our strategy. Five years ago, we went to it to provide a cost improvement to our organization. We're looking into compressed printing for the mid-year."

Another company that preferred its name not be used started making changes the last time it was hit by a paper shortage. "We went to 8 line/in. Every year, we sent out questionnaires to our users to review the way they do their reports," a spokesman said.

If some reports can be dropped, he said, the firm saves paper. The company is putting more data on microfiche, especially for large reference reports.

Many more users said they are evaluating the same measures and may include them to cut costs in the future.

In spite of the fact that paper costs continue to rise, 30% of the survey audience made no change whatsoever to reduce its paper consumption.

One user said that as long as his clients ordered DP tasks to be done, he would comply and charge them accordingly as prices rose. Another said that the "nature of my business" precluded any change in the way his operation consumed paper.

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Drives Speed Steel Maker's Throughput 400%

KANSAS CITY, Mo. — At Kansas City Works, a division of Armco Inc. here, disk and tape drives are being used to store the thousands of order and production data items related to the various steel products that move through the plant en route to the customer.

In addition, the equipment is reducing the time and expense of storing and processing this data, thus contributing to responsive sales service, balanced production resources and appropriate inventory levels, the firm said.

IMS. It is configured with approximately 70 CRTs and remote printers, two 1100 line/min printers, a card reader and card punch and a programable communications controller.

Disk equipment includes four spindles of Memorex 3670s, six spindles of 3650s and a Memorex 3653 controller. For tape, the company uses four Memorex 3226 magnetic tape units.

"We installed the Memorex equipment in two phases during September and October 1978," Gray said.

The 3650 direct access storage subsystems, which provide 200M bytes

ventory.

Because Kansas City Works is composed of a number of different mills, each with different processing requirements, Armco has taken a customized approach to system development.

"Our mills have such different kinds of products and processing needs that to write a single production control system, for instance, would be nearly impossible," Gray noted. "In any case, the system would be much too large, cumbersome and inefficient."

Bolts and Nuts

In the bolt and nut operation, as an example, there are more than 10,000 types and sizes of products. When a customer or salesman places an order for any of these products, either

through the mail or over the telephone, order entry personnel use a CRT terminal linked to the disk files to ensure that the part number is a valid one. After the number is verified, the order is entered into the IMS data base, where it stays during the day for reference. Price information from product catalogues is also entered.

If the product ordered is already in stock, the system reduces inventory by that quantity so the same item will not be sold twice. The product is then released to the shipping floor.

If the product is not in stock, a master "tag" for each production step involved in producing the item is printed. The tags are clipped on the sides of large metal cans containing the order as it moves through production.



Production data is entered through a CRT terminal into the disk files.

"The Memorex Corp. disk and tape drives are providing a cost-effective solution to our data storage needs," according to Thomas H. Gray, supervising systems engineer for operations and technical support.

"We needed reliable storage equipment that was compatible with our IBM 370/158 mainframe. The Memorex 3670 and 3650 disk-storage modules give us an excellent cost/performance ratio. And the 3226 dual-density tape drives are four times faster than our previous drives, speeding up our tape processing throughput significantly."

Kansas City Works, often referred to as a "supermarket of the steel industry," is basically a "bar" mill, fabricating items from the bars and rods it produces.

In addition to nuts, bolts, and nails of all sizes, Kansas City Works also fabricates joists, merchant bars, wire rope and strand, welded wire mesh, wire fence, reinforcing bars, track spikes and grinding balls. Total plant capacity is one million tons a year.

The plant's computer system handles a wide variety of batch and on-line applications. Batch applications include payroll, labor distribution and manufacturing control. On-line applications include sales-order control, production reporting and shipping and inventory control.

The system is currently up five days weekly, and three shifts daily. In addition, on-line data collection without an operator is up on the weekend.

The system mainframe is an IBM 370/158 running under OS/VS-1 and

per drive in compatibility mode and 317.5M bytes in native mode, have an average access time of 25M sec. The 3670 direct access storage subsystems, which provide 100M bytes per drive, have an average access time of 27M sec.

The 3226 dual-density tape units operate at 1,600 and 6,250 bit/in., with a data transfer rate of 200K and 781K bit/sec. Each unit contains a Tape Maintenance Monitor, which helps identify reels with error rates that warrant transferring data to another reel.

Backup Support

These tape units are currently used by the plant for backup as well as for the batch payroll, labor distribution and accounting systems.

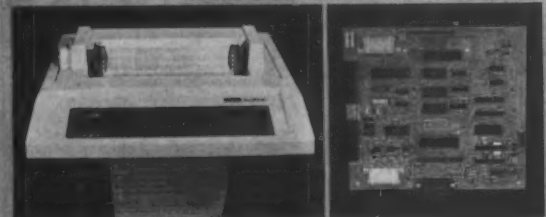
"One of the reasons we installed the tape drives," Gray said, "is that our backups were simply taking too long. Our Sysres backup, for instance, took 90 minutes. With the new drives it only takes about half that time."

"Another reason we got the drives is that they cut down on the amount of tape needed. All IMS transactions, for example, are logged on tape. Previously, these transactions took in excess of one tape a day. Today we rarely need more than one tape, which means a saving in tape-changing time and a resulting increase in uptime for our IMS terminal users."

Kansas City Works has recently been getting more heavily involved in on-line applications. Approximately 70 terminals are used on the production floor to track work in process, in sales for order entry and in shipping and in-

Baud News

Published by Datasouth Computer Corporation, 627-F Minnet Lane, Charlotte, NC 28210.



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As BAUD NEWS went to press, DS120's were providing enhanced speed and versatility for more than 3000 LA36 owners. The microprocessor-based electronics have proven very reliable, and service, when needed, has been prompt and efficient. Of course, the DS120 comes with a 90-day warranty on materials and workmanship.

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Datasouth reports a network of stocking distributors in major cities throughout the U.S. for prompt service and delivery. The spokesman added that he welcomes inquiries and will gladly give you all the details on the DS120. He can be called at 704/523-8500 or addressed at Datasouth's office, 627-F Minnet Lane, Charlotte, N.C. 28210.

DEC is a registered trademark of Digital Equipment Corporation. Installation of the DS-120 will void any DEC warranty or service contract.

To Cut Response Time Sixfold Disk System Maker Expands Field Maintenance

By Jeffrey Beeler

CW West Coast Bureau
SUNNYVALE, Calif. — System Industries, Inc. is expanding its field maintenance plan in six key U.S. cities in an attempt to cut its service-call response time sixfold.

Under the optional plan, System Industries guarantees it will respond in four hours or less to any customer service call originating within a 50-mile radius of New York City, Boston, Cincinnati, Chicago, Los Angeles and San Francisco.

The service plan is also being offered to the disk and tape system manufacturer's customers in London, according to Richard Milligan, the company's vice-president of customer and corporate services.

System Industries' "key-cities service program" reportedly represents an improvement over the firm's previous maintenance agreements, which guaranteed only a 24-hour response time to customer calls.

Users most likely to benefit from the company's latest service plan will include banks, insurance underwriters, accounting firms and other customers of System Industries' Model 9400 disk unit, which was introduced two years ago to operate with Digital Equipment Corp.'s VAX-11/780 and PDP-11/70 systems.

Service Staff Increased

The sixfold cut in System Industries' response time was made possible last quarter by a 25% boost in the firm's nationwide field-service effort, Milligan explained.

In New York City, for example, the firm increased its service staff from four to five members; in Boston, from one to two; in Cincinnati, from one to three; and in Chicago, from zero to two. In San Francisco and Los Angeles, the size of the company's service staffs remained unchanged, with three and four members,

respectively.

Further enhancements to the company's field-service effort will be announced later this quarter, Milligan said.

To supplement its key-cities maintenance plan, System Industries has also provided its customers with a 24-hour answering service. The company guarantees it will answer all calls to the service within

an hour and a half, Milligan added.

Choice of Coverage

As with System Industries' other service plans, the key-cities program provides customers with a choice of an 8-, 12-, 16- or 24-hour "service window." (Milligan defines a service window as the portion of each business day during

which the terms of a user's maintenance contract are in effect.)

If a customer summons a field-service engineer after its daily service window expires, System Industries will still respond to the call within four hours, if the user agrees to pay an additional fee.

The cost of System Industries' key-cities plan varies

with the length of a customer's service window and the type of disk or tape equipment it operates. For an 8-hour window and a 300M-byte disk system, for example, the program costs \$2,480/yr.

More information about the key-cities service plan is available from System Industries, 525 Oakmead Parkway, Sunnyvale, Calif. 94086.

"If the auto industry had done what the computer industry has done in the last 30 years, a Rolls-Royce would cost \$2.50 and get 2,000,000 miles per gallon."



'Once Upon a Time There Was a Little System Born of Grateful and Kindly Analysts'

Bank Controls Static, Grounds Teller Problems

LOS ANGELES — California Federal Savings and Loan Association here recently solved a DP problem by taking measures to control static electricity, which was causing computerized teller stations to malfunction at many different locations.

California Federal is the largest federally chartered savings and loan association in the U.S., with assets of over \$6 billion. Cal Fed serves more

than 750,000 customers through more than 85 offices throughout the state.

This institution pioneered the use of off-hour manned remote service units in grocery stores and supermarkets and has introduced other various customer services. Branches are located as far north as San Rafael and as far south as San Diego.

James K. Anderson, senior vice-president and head of the

management information services (MIS) division, said California Federal's static problems began when a network of upgraded teller stations was installed.

New minicomputer-controlled teller machines were incorporated into the institution's on-line DP system several years ago. About 300 separate teller machines are connected to the central system in Los Angeles by

phone line.

When the teller machines were installed, California Federal began to have a number of apparently unrelated terminal problems such as random arithmetic errors, lost transactions and teller station breakdowns, which they could not attribute to any one cause.

Virtually every phase of the MIS division joined in the search for a solution to these problems, including Califor-

nia Federal's electronic technicians, programmers and various vendor representatives, Anderson said.

Static Suspected

The underlying problem became apparent as officials began to hear reports that when an operator walked up to a terminal and touched the keys, a static charge would discharge to the equipment. Static electricity had been suspected as a possible factor in at least some of the problems.

Investigating further, Anderson and his staff learned that a person moving about in dry air, particularly on carpet, can develop static potential in excess of 30,000V — more than enough to wipe out computer information, which is based on several volts or less.

In some cases static discharge can even destroy sensitive electronic components such as microcomputers or solid-state memories. (Static voltage can develop whenever two dissimilar materials make contact and then separate.)

Mats Suggested

A 3M Co. sales representative heard about the static problem during a call to California Federal and suggested to Anderson that 3M's static control conductive floor mats be tried as a possible means to prevent the problem.

The 3M Velostat floor mats were designed for a variety of applications where a worker would be seated at a workstation. These mats are made of a conductive, carbon-loaded plastic and grounded to a wall receptacle by a thin ground cord made of the same material.

"We ordered several of the 3M mats as a test," Anderson recalled, "and the results were obvious and immediate. Teller stations with mats in place suddenly began to perform as designed without the variety of problems we had been experiencing."

"Although we cannot definitely state the exact cause of our initial problems, we can at

(Continued on Page 56)

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In only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.

But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible.

Right now, IBM has begun delivery of a new computer series that will, by itself, provide four times as much processing power as all the previous computers delivered by the company. And they have announced a new "superconductor" that could improve computer speed and performance by a factor of 500 in the next seven years! It's hard to remember this is real science, not fiction.

This extraordinary increase in efficiency has led to a rapid expansion in computer use, as human ingenuity finds more and more applications for these powerful tools. So the market for computer products and services has turned out to be more elastic than most observers had thought. Worldwide expenditures are currently at \$75 Billion, and growing by 20% a year.

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Our newest publication is **COMPUTER BUSINESS NEWS**, a weekly newspaper for executives in the U.S. computer industry whose organizations are involved in the manufacture, integration and resale of computer systems. This is a relatively new marketplace which has grown up around the minicomputer and microcomputer, and which shows every sign of very rapid growth for at least the next decade.



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'Logical Alternative'

End Users Turning to Third-Party Maintenance

By Stephen J. Keane

Special to CW

Sophisticated end users are increasingly turning to third-party firms for maintenance of their computer equipment.

More and more companies that own computers or obtain them from leasing companies are recognizing that independent maintenance is an attractive, cost-effective alternative to the service provided by major computer manufacturers.

Another reason for growth in third-party maintenance is the dramatic rise in the number of companies manufacturing and marketing DP systems and equipment. An increasing number of these firms are discovering that by arranging for a third-party maintenance specialist to service their prod-

ucts, the firms' personnel are free to do what they do best: design, manufacture and market products.

Despite its history of success and an outlook for 15% growth annually for the near future, independent maintenance has not always been a viable concept in the DP industry.

Traditionally, the major computer manufacturers leased complete systems to end users and were solely responsible for providing service for every component. When a user signed up for a system, he signed for its service too.

Two Changes

Two changes in the industry prompted end users to rethink this standard practice. The first of these occurred when military, governmental and other very large users began to separate system maintenance from system acquisition contractually.

The second change was brought about by independent manufacturers when they developed cost-effective, plug-compatible peripherals for use with the major computer systems.

Today, most users of DP equipment are sophisticated both financially and operationally.

Financial sophistication has led to a recognition that a computer system is a business tool. This tool can be owned and treated as an asset. Alternatively, however, it can be leased from sources other than its manufacturer. Moreover, maintenance and operation of this tool can be treated separately from hardware itself.

Operational sophistication has given end users the confidence to select and use the most cost-effective DP combinations to meet user needs, regardless of component nameplates. Multivendor systems abound as users seek to maximize results.

Interestingly, the prime advantages of third-party maintenance — costs that average around 20% less than comparable service from a major system manufacturer, and centralization of maintenance responsibility — provide benefits to end users that are financial and operational, respectively.

Balanced Combination

The service provided by independent firms attempts to balance remedial and preventive maintenance.

Most users appreciate the value of remedial maintenance. When something fails, they want it fixed immediately. Some companies, however, still consider preventive maintenance unnecessary — a waste of machine-time.

Actually, the opposite is true. Preventive maintenance ensures against equipment failure and helps prevent repair expenses. In light of the sophistication of today's DP equipment, guarding against equipment problems is equal in importance to being able to solve such problems quickly when they occur.

Contracting for Service

The complexity, maintainability, failure-ratio and type of system to be serviced determines fees charged by independent maintenance firms, as well as the extent of maintenance responsibility assumed.

In most instances, the independent firm will thoroughly inspect each end-user system — much like a doctor conducts a physical examination — and arrive at an annual service fee, usually paid in monthly installments.

Many third-party maintenance contracts cover complete systems (all components, peripherals, auxiliary equipment and so on) and provide price protection to the user.

When contracting for maintenance, the customer and the independent maintenance firm work together closely to determine the scope of services to be provided.

The service firm should also be knowledgeable of the company's work routine, so that preventive maintenance can be scheduled without interfering with processing deadlines.

In addition, full consideration must be given to such important factors as the proximity of service and support locations, each firm's average response time to service calls, the extent of spare parts on hand at service locations, the range of services provided and the types of test and diagnostic equipment available.

The prospective customer should carefully examine the training programs of each independent maintenance firm. Is training an ongoing process? Is it a high-priority activity with sufficient funding to have invested in modern training tools such as closed circuit television and videotape playback units? Does the firm keep pace with manufacturer changes and modifications? In all cases, the answer should be "yes."

New Entrants

Manufacturers entering the DP market for the first time

can utilize a large-party maintenance organization for virtually every aspect of customer service.

The benefits are immediate and significant. Payment of a single, known fee on a monthly basis prevents financial surprises. Avoidance of large start-up costs usually associated with launching a service organization permits concentration of resources of design, manufacturing and marketing.

In short, in new-entry situations where dollars are scarce and each has tremendous leverage for a growing firm trying to capture a market as rapidly as possible in a high-technology industry, the ability to turn to a professional maintenance company has great economic appeal.

Keane is president of Sorbus, Inc., a maintenance firm.

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Bank Controls Static, Grounds Teller Problems

(Continued from Page 55)

least infer that static was an important factor in many of them and that the 3M mats prevented static buildup from reaching the equipment."

As the company grew and added branch offices, the supply of floor mats was depleted, and several offices were put on the system without protective mats. The same kinds of problems began to show up.

Again a quantity of mats was ordered, this time the 3M Static Control Floor Mats specifically designed for stand-up (teller) applications. Again the

problems abated.

Because of the low electrical resistance of the floor mats, an electrical charge is drained away rather than discharged rapidly. As personnel step on the conductive mats during normal work movements, static charge is drained to ground instantly.

Fortunately for California Federal and other DP users, the static problems they normally encounter can be solved by the use of passive conductive floor mats. No operator effort is required.

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DG Expands CS Mini Family With Mid-Range Processor . . .

WESTBORO, Mass. — Data General Corp. has extended its Commercial Systems (CS) minicomputer line by adding a mid-range mainframe that handles up to nine interactive terminals for in-house local networks and supports RJE 80 and Hasp II communications protocols for decentralized DP activities.

At the same time, the company unveiled three program development software packages designed to fit all of the CS machines and introduced an upgrade option that allows users to move up to a more advanced CS computer without scrapping the entire processor.

Finally, the firm announced that its recently introduced Model 6100 dual-disk subsystem, that boasts either a 12.5M-byte or 25M-byte Winchester hard disk and an integral 1.26M-byte diskette, will now be available with all of the CS minicomputers — including the new addition.

Sandwiched between DG's CS/40 and CS/60, the CS/50 is built around the firm's Nova 4 processor, which has a cycle time of about 200 nsec. This speed compares with a 960-nsec cycle time for the company's low-end CS/20, which incorporates a Micronova processor, and a 700-nsec cycle time for both the CS/40 and CS/60, which use a Nova 2/12 or 3/D and Eclipse S/130 processors, respectively.

The CS/50 is available in three models: the C3, C5, C6. The first system supports 64K bytes of memory and up to three Dasher terminals, including the recently announced D/200 model. In addition, the computer setup comes with either a dual-disk subsystem or a 20M-byte fixed disk drive. The system also includes a magnetic tape drive with 800- and/or 1,600 bit/in. tape densities, a spokeswoman stated.

The models C5 and C6 include either 128K or 256K bytes of main memory and up to 80M bytes or up to 760M bytes of disk storage, respectively. Both models can handle up to nine Dasher terminals depending on the application, she added. In contrast, DG's top-of-the-line CS/60 system supports up to 17 terminals.

Upgrade Option

For the first time, users of lower-end CS systems can upgrade to a more sophisticated mainframe without having to go through extensive field service surgery.

CS/40 systems can be boosted to a CS/50

or CS/60, and CS/50 machines can be upgraded to a CS/60, by removing the mainframe subassembly and plugging in a new component. Before, the whole processor would have to be replaced.

While upgrade prices may seem a bit high, a DG spokesman noted that they are cost-effective for users who intend to keep their systems for a few years or more. To upgrade from a 128K-byte CS/40 computer to a (Continued on Page 60)



The CS/50 System

. . . And Unveils Band Printers

WESTBORO, Mass. — Several days prior to introducing its Commercial Systems (CS)/50 minicomputer, Data General Corp. unveiled a family of 300 line/min band printers and printer subsystems that are said to use a minimum of mechanical parts and feature a built-in diagnostic display.

Designed separately for DG's Micronova, Nova, Eclipse and CS computers, the printers all feature a steel band font carrier to aid in character registration and an LED diagnostic display. This display, together with a built-in self-test function, allows the printers to run independently of the computer system.

The models 4323 and 4324, for Micronova systems, have a forms length selector, a 12-channel direct access vertical format unit, a forms receiver tray and a 30-ft I/O cable. They offer 64- and 96-char. sets, respectively.

The models 4325 and 4326, for the Nova and Eclipse minicomputers, are based on the two previous printers but include a programmed I/O controller. Two other models, the 4327 and 4328, are similar to the 4323 and 4324, but are supplied with a data channel controller.

Introduced for the CS machines, the models 9260 and 9261 are programmed printer subsystems available with 64- and 96-char. sets, respectively. Finally, the models 9262 and 9263, for the CS line, include a data channel instead of an I/O controller.

Prices for the printers are \$9,500 for the Model 4323; \$10,400 for the 4324, 4325, 4327, 9260 or 9262; and \$11,300 for the 4326, 4328, 9261 or 9263 system. Quantity discounts are available from DG at Rt. 9, Westboro, Mass. 01581.

ABC Turnkey Package Includes Training Trip to Lake Tahoe

TAHOE CITY, Calif. — Sailing, skiing and a bit of gambling may not be the kind of options usually offered with a computer system, but they are included as part of the turnkey package announced recently by ABC Computers, Inc.

The system, called a "Minichester" word processor, is based on Digital Equipment Corp.'s LSI-11 processor and incorporates a double-density floppy diskette drive, 64K bytes of memory, a CRT and a printer. However, the system's \$14,900 price tag also includes the tab for air fare and hotels for software training in the Lake Tahoe va-

cation area, a spokesman said.

Mornings are spent in training sessions while the user's afternoons are free to take advantage of whatever the resort has to offer, he added.

The Minichester is said to be capable of executing the firm's business accounting software and operates with the Basic, Fortran, Cobol, APL and Macro-11 languages.

OEM discounts are available and start at 18%, including the customer training trip, or at 25% for OEMs who supply their own training. ABC is located at 500 Tonopah, P.O. Box 7529, Tahoe City, Calif. 95730.

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Floppy Disk Memory Ties DEC, IBM Processors

SANTA CLARA, Calif. — A double-sided flexible disk memory system, said to be the first such system compatible with Digital Equipment Corp. and IBM diskette formats — including IBM double-sided, double-density format — has been introduced by Data Systems Design, Inc. (DSD).

The DSD 480 reads and writes on both sides of industry-standard 8-in. diskettes, delivering a formatted data capacity of 1M bytes per diskette, or 2M bytes of on-line storage. The system is hardware-, software- and media-compatible with DEC's LSI-11 and PDP-11 processors and reportedly doubles the capacity of competing DEC-compatible flexible disk systems.

In addition, the disk system allows users to transfer data and programs between DEC and IBM mainframes. For example, a firm with DEC production control computers can supply production information to an IBM-based accounting system by interchanging diskettes, a DSD spokeswoman stated.

Incorporated into the disk system are a variety of user-oriented features such as a built-in hardware bootstrap.

The system is packaged in a 5.25-in. chassis for rack mounting or tabletop operation. With documentation, it costs \$4,495 from DSD at 3130 Coronado Drive, Santa Clara, Calif. 95051.



The IAS-32 With Optional Printer

DEC-Based Business System Allows Both WP and DP

ROCKAWAY, N.J. — Information Access Systems, Inc. (IAS) has unveiled a 16-bit business system that incorporates a packaged version of Digital Equipment Corp.'s PDP-11/03 processor and can be used for both word processing (WP) and data processing activities.

The IAS-32 is a 64K-byte machine built around a Zenith Data Systems WH-11A microcomputer. The system can support up to four terminals and handle multiple printers, according to an IAS spokesman.

The heart of the computer is the Dibex operating system, a plug-compatible software package made up of a series of time-sharing-oriented programs. Similar to DEC's Digital Business-Oriented Language (Dibol), Dibex allows users to perform several similar or different tasks by sharing the same hardware resources, the spokesman noted.

Included with the basic IAS-32 package is WP software that lets a user enter text without stopping to enter margins, tabs or page locations. Word Syst permits proofreading, correcting, reformatting or the insertion of new text after the original text has been entered, the spokesman claimed.

In addition, a library feature allows storage and retrieval of those frequently used or standard paragraphs.

Biz Syst, a general business software package, is available as an option for the wholesale, distributor and retail user. The package includes accounts payable, accounts receivable, general ledger, payroll and order entry/inventory, the spokesman said.

Each Biz Syst system contains a "getting started" section that gives the user sample test data. The user can proceed through the software step-by-step, then compare the test results contained in a systems manual with the data appearing on the system's CRT screen — helping the user learn how to operate the computer.

To further the learning process, IAS offers an optional three-day training program at both its New Jersey and Chicago test centers. Instructors there are available for training, to respond to questions and to aid in setting up either a WP or DP system or both.

The basic IAS-32 with the WH-11A processor, CRT terminal and dual-floppy disk drive costs \$9,635. The business software system, Biz Syst, is priced at \$995.

The training course costs \$350 if purchased with the system or \$500 if acquired after purchase.

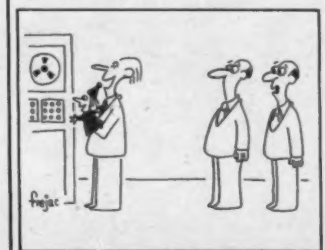
IAS is located at 87 Hibernia Ave., Rockaway, N.J. 07866.

Free Booklet Details Switch for PDP-11

WILTON, Conn. — T-Bar, Inc. has released a brochure describing its Series 3000 peripheral switch, compatible with Digital Equipment Corp.'s PDP-11 family.

The switch reportedly lets users share peripherals between multiple PDP-11s.

The brochure can be obtained from T-Bar, 141 Danbury Road, Wilton, Conn. 06897.



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Broker Turns to Technology for Personal Touch

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PHILADELPHIA — When clients step into the office of a particular stockbrokerage firm here and request a rundown of their portfolios, Bruce Fischer will probably turn to a minicomputer rather than a set of paper files to satisfy them.

Fischer is vice-president of Moseley, Hallgarten Estabrook & Weeden, Inc. He uses an IBM 5110 small business computer to track his clients' standings in the always-changing, never-predictable stock market.

By punching in a client's account number, Fischer can tell how many shares of each stock that client owns, the date they were acquired, date sold, the price paid and other pertinent details.

According to Fischer, his system software, called the Securities Portfolio and Transactional Analysis Program, is the first of its kind. It was developed with the help of IBM and Martin D. Pine, a consultant based in East Brunswick, N.J.

"I do not charge my clients for this service," Fischer stated. "More impor-

tant is that if one stock is showing a change, with one symbol I will know how many and which clients own the stock, how much they own and what they paid for the stock."

By programming a letter into the computer, the 5110 will write identical letters to each client, Fischer explained. The system also includes a text editing and word processing system.

At present, Fischer has more than 70 complete portfolios, representing 60% of his annual commission business, stored on memory disks and is gradually increasing it.

"In order to increase available business time — my most valuable asset — I knew I had to organize and computerize my entire operations," Fischer said, looking back. Also, it was important

that I maintain the confidentiality of my clients' accounts and the securities I purchase and sell.

"Today my system has three times the capacity and speed at one-third the price available in 1975," he added.

Monthly Portfolios

What exactly does the securities analysis program do? According to Fischer, it can produce a portfolio valuation, a portfolio analysis, a transactional analysis, a client/security retrieval system and a selective financial/securities reporting service for instant delivery of research reports and analyses in any investments, stocks or bonds.

As part of this self-contained desktop system, Fischer is now providing his

clients with detailed, monthly portfolio reports. The ordinary monthly report from a securities company merely indicates transactions and not complete portfolios, Fischer noted.

"While I have access to my company's analyses, my own computer is considerably more detailed and specifically relates to my own clients," he said. "With these monthly reports, a client can see at a glance where he stands with each stock held and decide whether he wants to make any changes."

Although Fischer would not divulge the size of his personal business, reports indicate that his commission production places him in the top 2% of the New York Stock Exchange's registered representatives.

Word Processor Has Dual CRTs

PALO ALTO, Calif. — Artec International Corp. has announced the Dual-Display, a word processing system that features a full-page CRT plus a single-line CRT keyboard.

The Dual-Display system consists of the two screens, a remote printer and a disk module. The 66-line CRT screen shows a full page of text, while the single-line screen prompts the operator, verifies commands or zeros in on a particular line of text.

In addition to underscoring, bold characters and super- and subscripts, the CRT is proportionally justified, showing the user exactly what will appear on the printed page, a spokesman said.

The system can store 200 pages of text per floppy diskette and can be used as a shared resource system that can be configured as a cluster of various workstations. Users can reportedly add up to four disk drives and eight workstations that can be a mix of CRTs, electronic display keyboards, printers or typewriters.

The Dual-Display costs about \$10,500 without printer. Initial deliveries are expected sometime this quarter, Artec said from 2585 E. Bayshore Rd., P.O. Box 10051, Palo Alto, Calif. 94303.



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File System Cross-References by Number, Code

PALO ALTO, Calif. — A microprocessor-based key-to-diskette filing system designed to cross-reference data by

numbers or code names has been announced by Tab Products Co.

The Tab 780 has a typewriter-style keyboard with a 10-key numeric pad that provides access to data stored on a series of floppy diskettes. In the basic system, the diskettes store 1,900 128-char. records that can be inserted, deleted or updated randomly, a spokesman said.

For hard copy, the system uses either a General Electric Co. Terminet 30, 120, 310 or 340 printer, with speeds ranging from 30 char./sec to 340 line/min.

Finally, in addition to the cross-reference application, a separate and optional mailing list program is available that can be used to organize and print labels and lists.

The system can reportedly locate names or data in the

diskette file within about three seconds. The station is geared for such applications as hospitals and medical clinics, banks, manufacturing and distribution, insurance companies and other firms that require easily retrieved file information.

The 780 costs range from \$7,200 without a printer to about \$10,000 to \$16,000 with a printer, depending on the Terminet model selected.

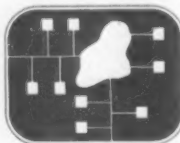
Tab is located at 2690 Hanover St., Palo Alto, Calif. 94304.



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For MPUs Using Multibus Single-Board Controller Unveiled

SUNNYVALE, Calif. — Microcomputer Systems Corp. (MSC) has unveiled a single-board controller for microcomputers using Intel Corp.'s Multibus bus structure that can control up to four Shugart Associates, Inc. SA4000 Winchester drives, four SA850 floppy disk drives or four SA4000 drives plus a 3M Co. HCD-75 magnetic tape unit.

The MSC-1086 controller is an extension of the MSC-1080 series which interfaces Shugart's SA4000 series drives to a variety of microprocessor buses. All of the units control multiple drives, including the

14.5M-byte SA4004, the 28M-byte SA4008 and the 58M-byte SA4100.

In addition, all the controllers, including the 1086, are based on a bipolar microprocessor, a spokesman said.

Multibus Interface

The Multibus interface on the 1086 board connects to the parallel data bus structure that was originally developed by Intel for 8080-, 8085- and 8086-based single-board microcomputers.

Besides including the standard formatting and operating functions, the controller also

boasts command chaining, error checking and correction, write protection, automatic head and cylinder switching, relative addressing and automatic seek to alternate disk tracks, the spokesman noted.

In addition, the controller can verify positioning for the MPU, test itself and buffer data transfers to eliminate overrun and underrun programs, he noted.

The MSC 1086 is priced from \$2,700 depending on the user's disk drives. Quantity discounts are available from the firm at 432 Lakeside Drive, Sunnyvale, Calif.

Mid-Range Mini Extends CS Line

(Continued from page 57)

128K-byte CS/50 costs about \$14,100, and moving from a CS/40 or CS/50 to a CS/60 costs approximately \$24,750.

The new software for the CS machines, which run under the Interactive Cobol Operating System, is reportedly structured to reduce the amount of time a user spends on program development. The first program, called First, is said to produce error-free Cobol code by automatically generating complete source code programs.

Programmers can use the software to generate programs for standard application functions by responding to questions flashed on the computer's CRT screen, the spokeswoman explained. First stores code in copy files, creating a library of function modules. These modules can then be incorporated into other applications.

The First routines are geared for such applications as file maintenance, inquiry handling, screen generation and transaction entry, she added. The software can be run on all the CS machines, including the CS/30 that debuted last year. But, it will not function on the CS/20 although the low-end computer can run First programs generated on other CS systems.

'Master' Package

The second package, Master, works similarly to First but allows a programmer to generate both a menu system, to tie an application's programs together, and a security system,

to protect programs and data. The menu system reportedly lets users plan and create uniform menu structures without additional programming.

'Jobs' Software

Finally, DG unwrapped its Job-Oriented Batch Stream (Jobs) software that allows operators to define and execute a stream of batch programs in bulk rather than having to start each one individually. The system continuously displays current status information on the process and signals the operator if an interruption occurs.

The Jobs utility comes standard with CS system software. First normally costs \$6,000 for an initial licensing fee, but is priced at \$4,000, as an introductory offer, during the next 90 days. By the same token, Master usually sells for \$1,500, but will cost \$1,000 during the introductory period.

Package Prices

The CS/50 C3, with three Dasher display terminals, a 20M-byte disk cartridge subsystem and a 60 char./sec Dasher terminal printer costs \$38,350. The same system but with a 12.5M-byte Winchester disk and a 1.26M-byte diskette sells for \$32,450.

The C5, including five Dasher terminals, the 20M-byte drive, a 300 line/min printer, a magnetic tape subsystem, one synchronous communications line and the RJE 80 software costs \$67,750. With the 25M-byte Winchester drive the system

costs \$62,350.

The C6 with the same features as the C5 except for a 50M-byte instead of a 20M-byte disk sells for \$76,050.

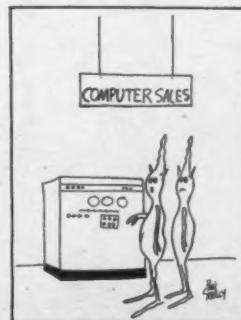
All of the system packages include the license to use DG's interactive Cobol software and system utilities, the spokeswoman said from Rt. 9, Westboro, Mass. 01581.

Two Pi Offers Booklet on V32

SANTA CLARA, Calif. — Two Pi Corp. is offering a booklet describing its V32 minicomputer which can execute industry-standard IBM 370 software without reprogramming and can use IBM and IBM-plug-compatible peripherals.

The literature also contains a brief description of the V/32's proprietary microprogram-controlled architecture.

The brochure is available from Two Pi at 3105 Patrick Henry Drive, Santa Clara, Calif. 95050.



Magnuson Moving Into Two More Markets

By E. Drake Lundell Jr.

CW Staff

SAN JOSE, Calif. — Magnuson Systems Corp., maker of IBM-compatible mainframes, will be moving into OEM and industry-specific markets during the coming year, President Joe Hitt disclosed during a recent interview.

The move is highlighted by Magnuson's recent \$10 million OEM contract with Storage Technology Corp. (STC), which will use a tailored Magnuson mainframe in an as yet unspecified product. Industry sources have speculated, however, that STC is developing a data base processor around the Magnuson computer.

Furthermore, Magnuson is expected to emphasize its OEM thrust within the next few weeks with the announcement of a processor tailored for that market.

place.

The move is built on a base of strong sales in the straight IBM replacement marketplace, Hitt indicated. A privately held firm, Magnuson had sales of more than \$10 million last year — essentially its first full year of operation — and has shown a profit since August.

End-user sales are strong, Hitt claimed indicating that the firm was shipping 10 systems a month at the end of the year, the maximum capacity of its old plant. Sixty systems are now installed, he said.

The firm recently moved to new facilities to overcome the production bind and now can expand to a production capacity of 60 machines per month, Hitt said.

While most of the orders have been replacements for IBM computers already installed, about 10% of the orders have

been for first-time users, he added.

However, the extensive use of micro-code and the bus-based architecture featured by the Magnuson machines allows the firm to easily tailor them for OEM or specific applications, Hitt said, leading the firm to open new marketing thrust in these areas.

Over the next few years, Magnuson expects OEM sales to reach about 10% to 15% of total sales.

As to custom systems for particular industry niches, Hitt cited the Exchange Bank in Tampa, Fla., where Magnuson and the user developed a system to control an IBM check sorter with a Magnuson computer, providing the user a 4:1 improvement over the IBM-based system.

(Continued on Page 67)

Case-by-Case Review Expected

Freeze on Soviet Trade Seen Thawing

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A slight easing of the embargo of technology exports to the Soviet Union is expected when the Carter Administration completes its review of trade policy in the coming week or two, according to government and industry representatives contacted here recently.

An interagency policy review committee, reviewing licensing of exports to the Soviet Union, is expected to produce an overall policy more flexible than the almost complete cutoff of high-technology goods now in effect.

While the government has permitted some goods to be exported for humanitarian reasons, such as spare parts for medical facility equipment, in general all trade with Russia in high-technology products — from tractors to computers — has been shut down.

The interagency committee, representing the Commerce, State, Defense, Treasury and Agriculture departments and including several federal trade officials such as U.S. Trade Representative Reuben Askew, has been studying U.S.-Soviet trade since President Carter stopped all technology exports Jan. 11 in response to Soviet military action in Afghanistan.

The new trade policy, expected to be announced soon, will probably allow for a re-

sumption of case-by-case review of export license applications, presumably with some of those receiving approval, according to a Commerce Department spokesman. The department also said there are no plans to include Eastern Bloc countries in the trade restrictions.

There has been some confusion here over whether Carter intended those Russian allies to be included in the embargo. The question is part of the interagency committee review, and Commerce officials have said they will watch exports to those countries to make

sure goods are not being channeled to the Soviet Union.

Lloyd Kaufman, director of foreign policy programs with the Computer and Business Equipment Manufacturers Association, speculated that the Administration might institute a "two-track" review system, permitting technology trade with Eastern countries that have Most Favored Nation status, such as Romania and Hungary, but curtail trade to those that do not, which includes the Soviet Union, East Germany and Czechoslovakia.

(Continued on Page 66)

Lockheed Sells Mini Named Sue

CAMBRIDGE, Mass. — BBN Computer Corp., a recently formed subsidiary of Bolt, Beranek and Newman, Inc., has agreed in principle to acquire the inventory, rights and other assets relating to the manufacture of the Sue and Super Sue minicomputers, now made by Lockheed Electronics Co.

Primarily a developer of weapon control systems, Lockheed recently dropped out of the computer business, which it entered in the early 1970s.

Aside from Sue and Super Sue, Lockheed also marketed the Lockheed System III, aimed at the IBM System/3 market. However, these lines have not been profitable for

Lockheed, contributing less than 4% of its annual \$150 million sales volume.

BBN Computer is one of the major OEM customers for the Sue and Super Sue line. "This acquisition will protect an important source of supply and will enable us to expand our manufacturing capability," Dr. W.B. Barker, BBN Computer president, said.

Although no financial details were disclosed on the agreement, if the deal is completed BBN Computer will acquire Lockheed's manufacturing plant in Hong Kong, where the minicomputer line is fabricated.

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DEC Steps Up Production

MAYNARD, Mass. — Digital Equipment Corp. confirmed it stepped up production of its Decsystem-10s and 20s four months ago at its Marlborough, Mass., plant.

Although the company would not disclose the amount it increased capacity, a source said a 30% production increase was made. DEC said it had some excess capacity at the plant and decided to allocate it to the manufacture of its large Decsystem-10s and 20s.

Prior to the step-up, DEC was delivering the systems within four to six months. Now the delivery is nine to 12 months, DEC said, adding the company thinks this is "adequate given the lead times for the rest of the industry."

DEC declined to comment on the reason for the longer delivery times despite increased capacity.

Telefile May Lose \$2 Million

IRVINE, Calif. — Telefile Computer Corp. said that losses for fiscal 1979 ending Sept. 30 may exceed \$2 million. As a result, the company will not be in compliance with certain financial covenants specified by its primary lender, the First National Bank of Chicago.

Telefile owes about \$7.5 million to the bank and has pledged virtually all its assets as security for that loan. The bank also holds \$3 million

worth of preferred stock on which unpaid monthly dividends have accrued over the past seven months.

A dispute has arisen between the bank and the company over a \$750,000 demand made by the bank last September. Telefile subsequently paid the bank.

The company is currently negotiating "an acceptable arrangement" with the bank, which reportedly will be concluded in the next few weeks,

but said it could offer no assurances that the outcome would be favorable. Telefile Chairman Samuel V. Edens would not comment on the company's outlook for the immediate future.

The firm has retained Montgomery Securities of San Francisco to assist with the restructuring or discharging of Telefile's debt and with the search for additional working capital.

Source of Predicament

The company's financial predicament stems largely from the delayed development and introduction of its Xerox Corp. Sigma-compatible Telefile 85.

To complicate matters, Honeywell, Inc., which acquired the Sigma base from Xerox, has already introduced two competitive products. Introduced in 1978, the DPS/C, an upgrade for Sigma's CP-5 operating system, allows high-end Sigma users to run Honeywell's CP-6 system on the Level 66 DPS/C mainframe.

The Honeywell CP-6-driven Level 66/-DPS/B3 was introduced last year targeted for mid-range Sigma users [CW, May 21].

Honeywell, NEC Ending Pact

MINNEAPOLIS — A long-standing technical agreement between Nippon Electric Co. (NEC) and Honeywell, Inc., scheduled to expire in 1982, has already been partially ended with the termination of a section of the agreement on technical "know-how" exchange.

For nearly 20 years, Honeywell provided computer-related technical assistance to NEC in the research and development and manufacturing phases of the Japanese firm's hardware products. This kind of technical exchange is fairly common for joint venture purposes and is used to get one or the other company up to speed, a Honeywell spokesman noted.

No More Needed

Both companies indicated they no longer saw the need for such a technical exchange — a move that indicates the Japanese computer company is fully able to compete on its own merits without assistance.

The patent license section of the agreement — still in effect for three more years — allows NEC to manufacture and sell Honeywell Series 60 computers in Japan.

No decision has been made as to whether that portion of the agreement will be continued after 1982, according to the Honeywell spokesman.



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SSTI to Be 'Aggressive and Mean'

By Ann Dooley

CW Staff

WOBURN, Mass. — A newcomer to the computer industry, Solid State Technology, Inc. (SSTI) intends to make its presence known to its minicomputer competitors by "coming out fighting."

"We're the new kid on the block" and therefore have to make a big impact quickly, SSTI President John Biondo stressed. "We're going to be known as a company that is aggressive and mean — a company that makes it its business to exploit other companies' weaknesses."

Previously a manufacturer and marketer of roadside call boxes, Biondo felt constrained by the government's bidding system and wanted to diversify. Recognizing the growth of the minicomputer market, Biondo brought his company into the computer market with the introduction of the Athena 8285 desktop computer at the National Computer Conference last year.

The Athena can reportedly expand from an intelligent terminal at the low end to a stand-alone processor at the high end.

Concentrating on OEMs

Selling primarily to the OEM market or to large system users, SSTI may eventually market to end users. For now, however, it would rather concentrate on building the technology and letting the OEMs market and sell its products.

Approximately 200 Athena 8285 machines have been shipped in the last few months since it went into production; the preproduction machines placed in installations account for many more, according to Roger Trudeau, director of marketing. Shipment backlogs total an additional \$26 million, he claimed.

SSTI currently has 34 OEM customers and markets in Europe through foreign distributors.

And to prove its claim of aggressiveness, SSTI's sales are seemingly doing so well that the firm is moving its manufacturing facilities to a new, nearby plant as of March 1. Once in the 60,000-square-foot facility, SSTI hopes to produce as many as 70 systems a week.

"Coming in late, we can take advantage of existing technology to downsize and bring the price down," Trudeau noted.

Approximately 85 people will be hired for the manufacturing facility. SSTI has doubled its overall personnel since last July, lending credence to the claim that the firm is gearing up for strong competition.

Biondo considers himself a businessman and as a businessman did not hesitate to

leap into the manufacturing of minicomputers, although he had very little knowledge of the marketplace or a technical background in computers. The same principles apply and the same problems exist in any business: "If you're good at one, you'll be good at any other," he contended.

Approaching the market with this attitude, Biondo hired a qualified staff of computer and marketing person-

nel, but he retained the business control.

Although admitting that SSTI will encounter problems, Biondo noted that the major one will be that of credibility.

The edge that SSTI has is that "we have no skeletons in our closet," the pleasant but feisty Biondo stated. "We don't have any friends we have to cater to or any hybrid machines built to replace others."

According to Biondo, SSTI doesn't have to fear the big companies because these companies have bureaucracies which create product, people and marketing weaknesses.

For the moment, however, other minicomputer companies are not really afraid of SSTI because it hasn't proven itself yet. "They won't be aware of us until we start to affect them — and then it will be too late," Biondo predicted.



CW Photo by A. Dooley

John Biondo

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Conference Panel Calls Warc a U.S. Success

By Jake Kirchner

CVW Washington Bureau
WASHINGTON, D.C. — While not a 100% success for the U.S., the 1979 World Administrative Radio Conference (Warc) did produce results that will allow American telecommunications companies to maintain existing operations while moving into innovative services, according to industry and government officials who met here recently.

Addressing a session of the recent Communication Networks '80 conference here, a panel of federal officials and industry executives were optimistic but by no means giddy about U.S. prospects for future use of the electromagnetic spectrum as decided at Warc, held in Geneva last fall.

Comments were typified by Edward Weppier, AT&T director of technical standards and regulatory planning, who

said, "Our reaction is favorable."

Weppler, as well as representatives of Communications Satellite Corp. and Motorola, Inc., emphasized that the outcome of Warc, as of all international negotiations, represents a compromise.

They stressed, however, that no existing activities of U.S. telecommunications carriers would be significantly degraded and that the Geneva

talks opened a number of opportunities to explore new services.

Tempered Enthusiasm

Their enthusiasm was tempered, they said, by the fact that the Warc business is far from settled. Although a treaty resulting from the conference goes into effect Jan., 1982, a number of world and regional conferences will be held during the next five years

to iron out some of the fine points of the negotiations.

Wars, convened every 20 years by the International Telecommunications Union (ITU), a U.N. organization, controls the international allocation of the electromagnetic spectrum, governing all global communications from radio and television to advanced satellite-based data communications services.

The 1979 Warc brought together some 2,000 delegates from 152 countries to consider over 14,000 proposals.

Political Worries

They were also especially pleased at what did not happen, namely a large-scale politicization of the conference by the lesser-developed countries, whose numbers dominated the conference and who have become increasingly vociferous about U.S. and European domination of spectrum allocation.

There had been considerable concern in Washington that prolonged, sharp debate over the so-called "new world information order" would fragment the conference into arguments between developed and underdeveloped nations and North and South countries [CW, July 30].

Given these worries, the 1979 Warc can be considered "a great and glorious success," the networks conference was told Jan. 28 by panel member Glen O. Robinson, chairman of the U.S. Warc delegation.

An overriding U.S. objective was to maintain the integrity and structure of the ITU without politicization, Robinson said. Although any international negotiations are, of course, political in nature, the aim of the U.S. was to "minimize political disputes" and to steer the conference away from "abstract issues."

Donald Jansky, associate administrator of the National Telecommunications and Information Administration (NTIA), said "everyone ended up equally unhappy," which is his measure of a successful international conference.

Jansky predicted Warc "will spawn a great number of services" for computer communications users as well as vendors. There will also be increased markets for sophisticated microprocessor-based equipment to help fine-tune telecommunications networks coexisting in crowded sections of the spectrum, he said.

He emphasized that Warc is a treaty conference and must be approved by the U.S. Senate. NTIA and the Federal Communications Commission (FCC) have already begun organizing themselves to develop recommendations to implement the voluminous decisions made at Warc.

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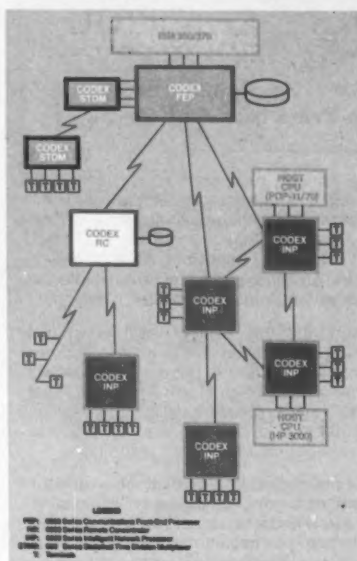
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VDC Predicts Demand For Winchester Disks 'Tepid' in Year Ahead

WELLESLEY, Mass. — In spite of industry optimism, Venture Development Corp. (VDC) here predicted the demand for 8-in. Winchester-type disks will be "tepid" for the next year.

This will be particularly true for the high-performance drives, the firm said in a recent report entitled "The Hard Disk Industry: A Strategic Analysis."

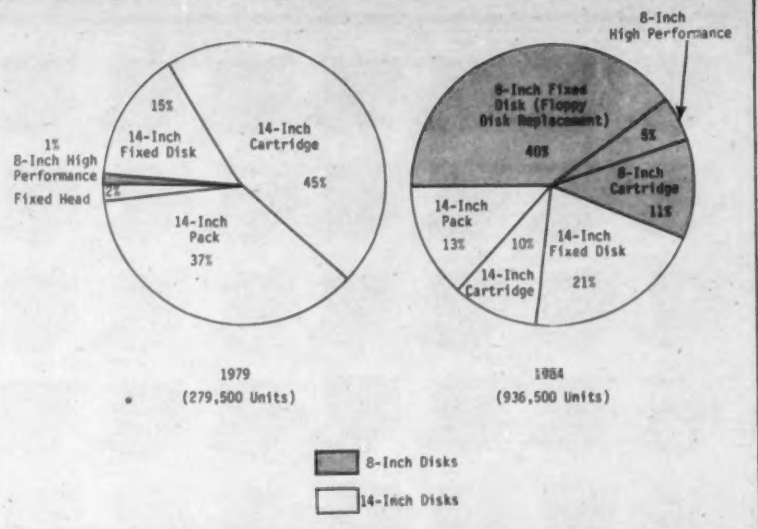
However, as lower performance hard disks become available, they will be integrated rapidly into systems and should account for 40% of the marketplace by 1984, the firm said. These lower performance hard disks will primarily be used as floppy disk replacements, the firm added.

The difficulty in obtaining parts for 8-in. Winchesters to

make small production runs relates to a lack of firm orders for sizable quantities of the devices while the industry plays a game of "wait and see," the firm noted.

The report compares the reception of the digital cassette and the floppy disk in the early 1970s with that accorded to the 8-in. Winchester.

"Everyone cursed the cassette, but they designed it into their equipment anyway because the need was overwhelming," VDC said. By contrast, the fixed disk drives with sealed, lubricated disks, which are commonly referred to as "Winchesters," enable the manufacturer to offer more performance than a removable disk drive, but the lack of removability is a drawback to the user, not an ad-



These charts from Venture Development Corp. show its prediction of disk drive shipments for minicomputer-based systems. The percentages refer to share of market.

vantage.

VDC believes that there will be a strong demand for the low-cost, low-performance 8-in. Winchester drives, which will replace floppy disk drives, especially in multiple floppy-disk drive systems where an 8-in. Winchester drive could take the place of one of the floppy disk drives.

The resulting storage system would then provide one drive which is low performance but hard disk standards, but would be many times superior to the floppies in storage capacity, access time and transfer rate, while the system still offers removable floppy disks for archival storage.

The rate of shipments of

low-performance floppy-disk replacement drives will reach 375,000 units in 1984, which is a larger figure than all of the hard disks shipped in 1979, VDC predicted. The selling price for these drives in OEM quantities, however, will be less than \$1,000, the firm added.

A trend toward further technological diversification of the drive industry is also forecast. At the same time that the market is growing for very low cost fixed disk drives, which compete on a "cost-per-box" basis, the larger drives will offer higher and higher densities, continuing to compete on a "cost-per-bit" basis.

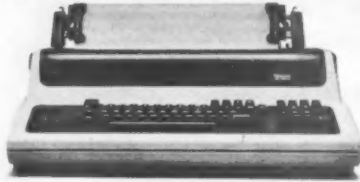
Fourteen-inch fixed disk,

cartridge and disk pack drives will coexist, VDC said, and 8-in. cartridge drives will be developed to compete with 8-in. fixed disk drives. Most cartridge drives will contain a fixed "Winchester"-type portion in addition to the removable cartridge.

By 1984, shipments of high-performance 8-in. fixed disks will reach a level of 54,000 units, while 8-in. cartridge drives will be selling at twice that level.

Further information regarding this report can be obtained from Edward A. Ross, senior consultant, Venture Development Corp., One Washington St., Wellesley, Mass. 02181.

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digital

Soviet DP Cutoff Seen Easing

(Continued from Page 61)

Of more concern to the DP industry, however, is not which communist countries will be allowed to trade with U.S. firms, but which of the U.S. allies will respect the U.S. call for a mutual trade cutoff, according to Kaufman.

So far, several competitors have voiced support for the U.S. position, but only Great Britain has shown a willingness to match the trade cutoff. Germany and Japan have backed the U.S. move to a certain extent and the signals from France have been contradictory at best, he noted.

While these problems are being sorted out, the Commerce Department continues to accept license applications for technology exports, although none are being approved.

One fear of industry is that once a new export policy is instituted, increased scrutiny of applications will slow down an already lengthy approval process and further tax an already overburdened review system.

As to how long the trade restrictions will last, few are

willing to speculate, since at this point the Russians do not show any sign of removing their troops from Afghanistan at an early date.

The recently enacted Export Administration Act curtails trade controls for foreign policy reasons, but the President still has the authority to cut off trade to protect national security. Whether or not the Carter action falls under that last heading, he will probably not be challenged to restore trade with the Soviet Union.

Although Congress is not pleased that Capitol Hill has been all but left out of Carter's decisions on trade, there is little chance Congress will chal-

lenge his move in light of its political popularity.

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Judge Expected to Rule Soon on EDS vs. Iran

By Susan Sanders
Special to CW

DALLAS — A United States district judge here is expected to rule within the next few weeks on a \$23 million lawsuit filed by Electronic Data Systems, Inc. (EDS) against the government of Iran.

The suit was filed last March after EDS charged, the Iranian Government failed for several consecutive months to make payments on services it had contracted with EDS to provide [CW, March 12].

EDS entered into a three-year contract in November 1976 with the government of Iran, then headed by Shah Mohammad Reza Pahlavi, to install and operate DP services for Iran's national health insurance and social security system. Iran continued to make payments until June of 1978.

No Pay, No Work

Despite internal turmoil in Iran at that time, the Iranian Office of Health and Social Welfare requested that EDS continue to work on the systems without pay for a short time, according to Bill Wright, EDS director of corporate communications. The firm agreed, but by December 1978 it refused to continue any longer without payment. The contract was terminated; EDS filed its lawsuit the following March. Iranian assets were attached, assets which EDS hopes to recover through the suit.

Magnuson Eyes Two Markets

(Continued from Page 61)

Another possible industry niche would be the wider marketing of the library automation system under development at the University of California at Berkeley with the help of Magnuson.

With such specialized systems, users can remain 100% compatible with IBM software, but the Magnuson machine can be tailored through the microcode to perform the specific task at hand more effectively, Hitt explained.

These new directions will make Magnuson more than just an IBM "plug-compatible" supplier, Hitt said. At the same time, it will be able to maintain its position in that market.

Delivery Dates

The Magnuson M80/32 will be delivered to first customers in April, he said, while the M80/42 and 43 will be delivered in September. Those two machines are Magnuson's response to IBM's 4300 series.

Hitt expects two more 4300 machines from IBM — one between the 4331 and 4341 and one above the 4341 in power. Magnuson is ready to respond to those offerings, Hitt said.

Users with delivery problems on the 4300 series are good prospects for the Magnuson units, he indicated, as are users that want to unload their large mainframes of specific tasks, such as program development.

In addition, the use of Magnuson machines as either front-end or back-end processors is a possibility, he said, theorizing that the systems could even be tailored as applications engines for specific applications.

Donald L. Case of the Dallas law firm of Jackson Walker Winstead Cantwell and Miller was the attorney representing Iran in the two-week-long hearing, which began Jan. 14 and concluded with final arguments Jan. 28.

According to Case, the main points Iran made in its defense were that the contract was procured in an illegal manner (through an intermediary) in the first place and that EDS has "not performed under the contract as it was supposed to." Consequently, the new government, under the leadership of the Ayatollah Khomeini, contends that it was not obliged to continue making the payments.

The overall atmosphere of the hearing, which took place in a downtown Dallas courtroom, was subdued, Case

said.

The trial was not without its moments of tension, however. The U.S. Marshal's Office was called in to provide strengthened security when two Iranian witnesses were called to testify.

The extra protection, throughout was to ensure that no incidents erupted as a result of the emotional reaction some citizens have had toward Iranian citizens after 50 Americans were taken hostage at the U.S. embassy in Tehran last November.

While he never had any direct contact with the government of Iran either when preparing the case or during the hearing, Case worked through an Iranian lawyer who had communications channels with his government, an indication that Iranian officials were

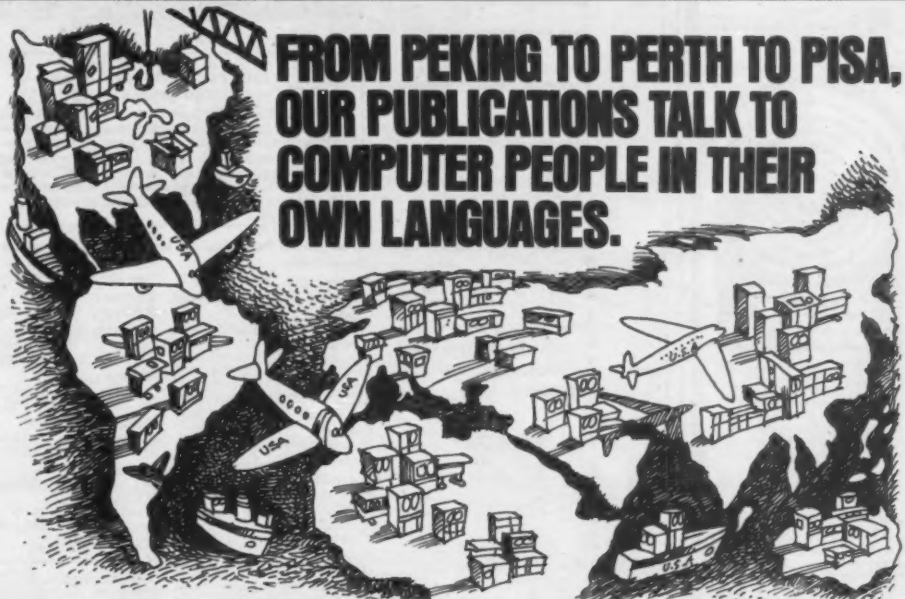
very much interested in the outcome of the hearing.

If EDS wins the lawsuit, it hopes to recover the assets it attached prior to President Jimmy Carter's order freezing all Iranian assets in the U.S.

If the case is decided in Iran's favor, that country may find its funds still tied up as a result of Carter's freeze order.

EDS' Wright described his firm's case as "simple and straightforward." At the heart of the matter, he said, "is just that we want our money. That's all there is to it."

Though Case contended that the matter is slightly more complex than that, he noted that it is more a business dispute than an international disagreement.



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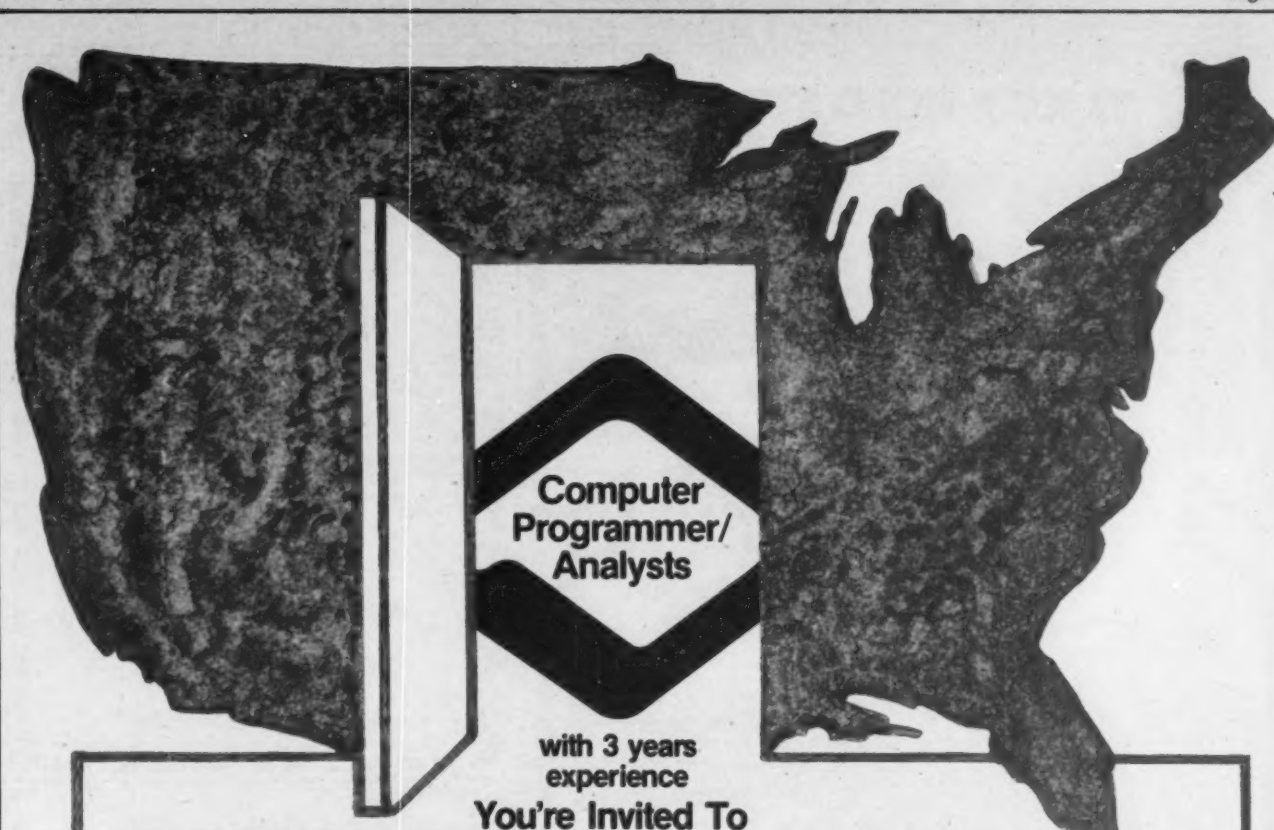
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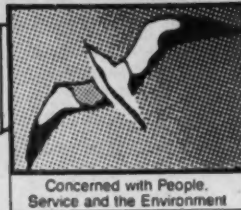
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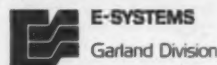
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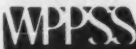
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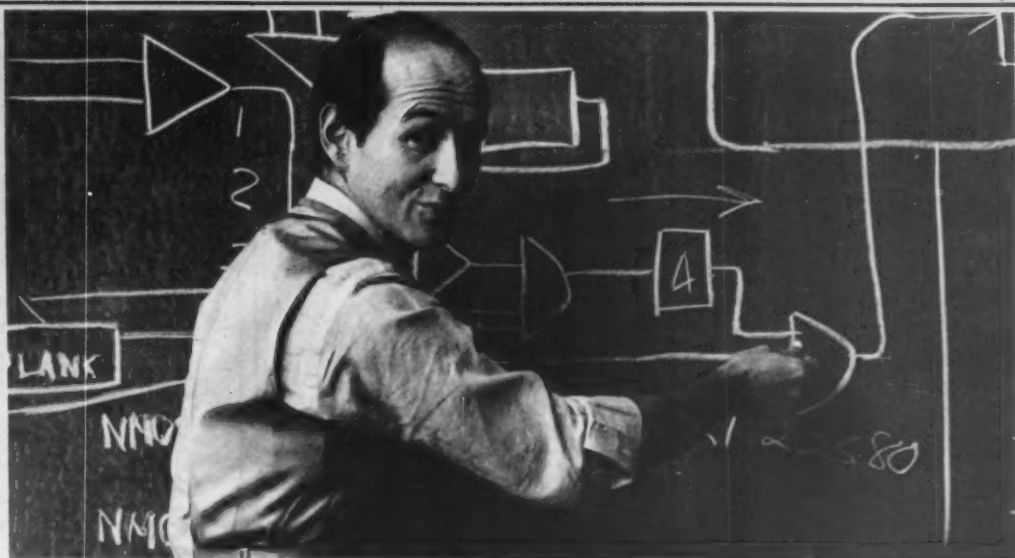
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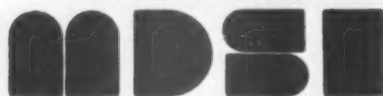
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Systems Programmer	IBM (OS/VS1, MVS, JES3); Honeywell (GCOB)	to \$38K
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Ferris State College has an immediate opening in the Administrative Computing Systems area. This position requires one year of experience and expertise in COBOL, ASSEMBLER and Data Base. Graduation from an accredited Data Processing Program may be substituted for experience. Our equipment is a 1 1/2 meg IBM 370/145 running under VM. We are supporting DOS/VS and OS/VS1 with on-line application development. Send resume and references to:

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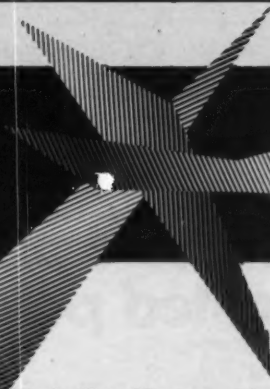
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Minimum 7 years experience in commercial data processing in sales, support, and marketing roles. Knowledge of on-line business data processing applications is essential. Responsibilities will be to define opportunity markets for transaction processing applications; to define market requirements for Perkin-Elmer products and services; to promote sales efforts in commercial data processing through customer support, seminars, trade shows, etc.

Product Specialists

Need software and systems persons knowledgeable in multi-discipline operating systems, transaction processing, and event driven real-time applications. Require hardware persons skilled in advanced computer architectures, multi-processors, and intelligent I/O subsystems. Responsible for translating new user needs into a meaningful set of specifications for our engineering department.

Competitive Analysts

Must have good technical, market, analytical, and written communications skills. Candidates will produce regular reports on all major competitors and participate in product and market planning.

Perkin-Elmer's Computer Operations is an organization designed to meet the challenges of the 1980's. Our mandate remains clear: we will continue to provide pioneering technological leadership in the small and medium scale computer industry. Our strength is our people. We have always relied on our staff of dedicated professionals to design, develop, market, sell and service our lines of state-of-the-art minicomputers and systems. At Perkin-Elmer, we believe that technological innovation is the most effective vehicle for providing career growth.

The Computer Marketing organization is responsible for determining the marketing direction for computer operations by identifying markets, predicting new product needs, merchandising the resulting product offerings, training the sales organization, and monitoring the business results. Through a thorough understanding of the markets of today, the technology and the business goals of Perkin-Elmer, computer operations marketers must consolidate the company's strengths and focus them on opportunity markets of the future. We need people who have experience with the technology and the markets for super minicomputers in the 1980's to join our team.

Marketing Managers/ Specialists - CAD/CAM

Requires a technical degree. Preferred background in sales or analyst experience in industrial markets, working knowledge of FORTRAN and excellent communications skills desirable. Responsibilities will be penetration in computer-aided design markets, including market research, evaluation/recommendation of software products to penetrate markets, merchandising CAD/CAM products through promotion, advertising and seminars, and customer/project tracking.

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Product management experience in the areas of computers, peripherals, or associated equipment is required. Technical sales and hardware design or maintenance experience is desirable. Responsibilities will include long-term processor product strategies, proposals and plans for development of specific products and marketing plans and merchandising of current and future hardware products.

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Positions are also open to Data Communications Marketing Professionals, Technicians, Programmers, and Analysts.

You will enjoy the GTE Telenet environment—innovative, stimulating, challenging. And you will enjoy the growth potential and advancement opportunities inherent in our national leadership. A generous compensation/benefit package is still another reason to join us now. Send your resume in complete confidence, including salary requirements, to: Douglas B. Macaulay, Manager of Employment, GTE Telenet, 8330 Old Courthouse Road, Vienna, VA 22180. An equal opportunity employer m/f/h.

GTE Telenet
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Beginning salary range is \$27,851 to \$29,912 depending on experience; excellent fringe benefits.

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Scientific Programmer**

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The system environment is IBM, MVS, WTSUR, COBOL and the IDMS data base system. Applicants should have at least two years experience in a similar environment. Firm's classification will be Programmer/Analyst II with a minimum starting salary of \$16,267. Position closes 2/28/February/80.

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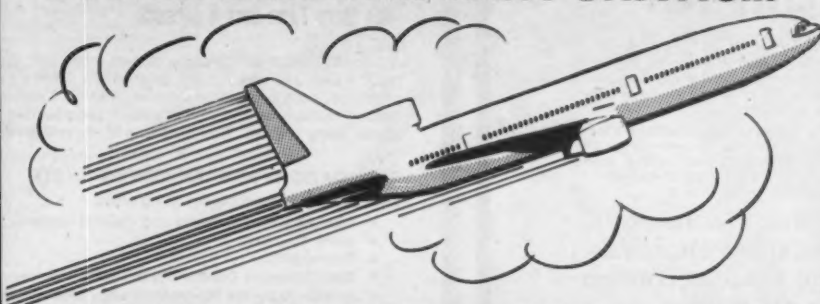
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ENVIRONMENT: Our data processing system is a data base distributive teleprocessing network consisting of approximately 200 terminals and 15 remote job entry devices. Our main computer, an IBM 370/158, provides business, administrative and instructional programs. We are upgrading to a triple processor fully integrated system with 4 network processors. Our main shop language is ANS COBOL V4 for applications programming APL and BASIC are used for our instructional programs.

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TECHNICAL SUPPORT ANALYST

Candidate should have one to five years experience in MVS, telecommunications, VASM, TCAM, 3705/NCP, VM/CMS, Graphics, and Plotting Support.

EQUIPMENT EVALUATION ANALYST

Candidate should have one to five years experience and some background in computer performance measurement and capacity planning.

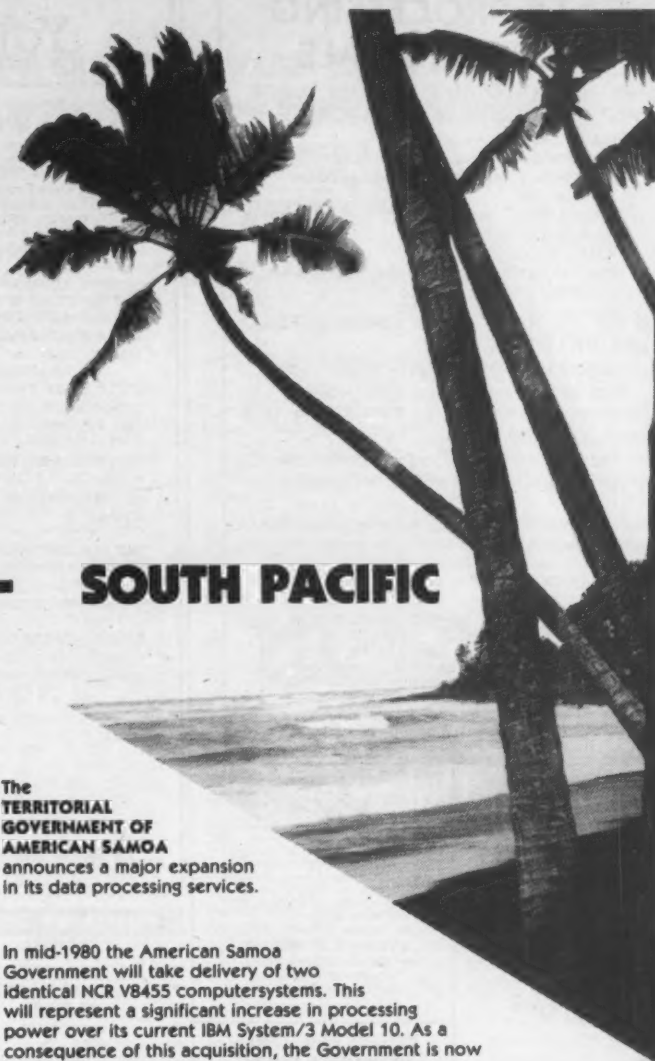
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Desirable background will include: IMS/VS DB/DC in large scale MVS environment, Application Design, Logical Relationships and Data Base Design, maintaining Data Dictionary systems, and developing IMS DB/DC Education Programs.

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In mid-1980 the American Samoa Government will take delivery of two identical NCR V8455 computersystems. This will represent a significant increase in processing power over its current IBM System/3 Model 10. As a consequence of this acquisition, the Government is now recruiting for the following three contract positions:

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Requires a Bachelor's degree or equivalent with two years of study in electronic data processing plus four years' experience as a Computer Programmer. Years of directly responsible employment may be substituted for a portion of the academic requirement.

COMPUTER PROGRAMMER/ANALYSTS (2)

Requires a Bachelor's degree or equivalent in computer science, business administration, mathematics, engineering or closely allied field plus six years' experience, at least three of which was as a Project Leader.

In addition to these minimum qualifications, the successful applicants should have a thorough knowledge of NCR's VTX Operating System, COBOL '74, NCR TRANPRO as well as extensive programming experience with typical financial applications. Knowledge of IBM's RPG II is highly desirable as is experience in converting from batch processing to on-line computer systems.

The American Samoa Government pays competitive salaries as well as providing free transportation and shipping allowances to contract employees and their dependents. These positions are non-Federal employment for a two-year term and include benefits such as sick leave, twenty-six days annual leave, free medical care and furnished housing for a nominal monthly rent. American Samoa is a Territory of the United States and is located in the heart of Polynesia; it enjoys a year-round tropical climate and an informal lifestyle similar to Hawaii.

To apply for either of these positions, please airmail a complete resume and copies of your credentials to: The Director, Office of Manpower Resources, AMERICAN SAMOA GOVERNMENT, Pago Pago, American Samoa 96799.

DEADLINE FOR RECEIVING APPLICATIONS IS FEBRUARY 29, 1980. Selective interviews will be conducted in the United States during March and/or April with a probable commencement date of no later than June, 1980.

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Appleton

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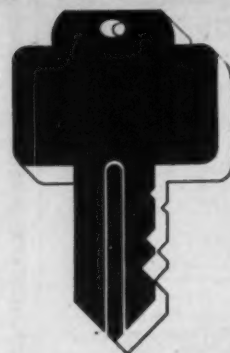
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Immediate opening for the right individual with the following qualifications:

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We are interested in VM, OS/VS1, DOS/VS, MVS professionals and 380/370 I/O and CPU Field Engineers.

We offer ground floor growth opportunity and our compensation and benefit package includes company paid medical, dental, hospitalization, life insurance and free prescription drugs. Our salaries are very competitive.

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Applicant must have minimum of three (3) years' experience as Analyst/Programmer plus two (2) years other data processing experience. Language requirements include Cobol, with ALC or RPOIT an asset. Experience with insurance industry would be beneficial. Firm utilizes IBM 370/138 DOS/VS. Send resume and salary requirements to personnel office.

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Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals — and, never being challenged by new goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Raichle, Data Processing Specialist.

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For consideration and further information, send resume and salary history to **James J. Heinze, L.R. ASSOCIATES, Highland Office Center, Suite 493, 550 Pinetown Rd., Fort Washington, PA 19034, (215) 645-5726.**

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(Salary commensurate with qualifications and responsibilities). Responsible to the Executive Vice President for the management of personnel, finances, equipment, development, and implementation of programs policies and procedures related to the entire operation of the campus Computer Center. Experience in development of hardware and software specifications for data base management. Equivalent to five years of progressively responsible experience, two years of which has proven management experience within a data processing environment, including responsibilities in supervision of personnel and budget planning and administration and managing the integration of hardware and software systems. Closing date: 3/21/80.

For official application contact the Personnel Office, California Polytechnic State University, San Luis Obispo, California 93407; (805) 546-2236. Affirmative Action/Equal Opportunity Title IX/Rehabilitation Act of 1973 Employer.

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Several recent promotions have resulted in openings in our systems group for experienced applications programmer/analysts. Responsibilities of these positions include the design, programming and implementation of new systems applications and modifications to existing applications. Extensive interface with users is required in the definition of systems objectives, establishment of detailed specifications and the preparation of project control documentation.

The candidates for these positions will be college graduates with degrees in Business, Accounting, Engineering or Computer Sciences, and have 2 or more years of experience in business systems analysis in a manufacturing environment. Proficiency in COBOL is essential. Knowledge of data base and data communications concepts, real-time systems design and control, project management and/or UNIVAC specialized software will be strong pluses. The successful candidate will be highly motivated, well organized and possess good communication and interpersonal skills. \$3-\$5.

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A BS in Computer Science or the equivalent is required plus 3-5 years experience in Assembly language programming and documentation for mini and microprocessor controlled product applications. Candidate must possess strong communication skills.

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COMPUTER PROGRAMMER

Salary Range:
\$17,000-21,250

Requirements: Individual should be able to develop computer programs for input and retrieval of medical, dental and other data. Prepares modification and operating procedures for new programs. Codes programs, makes computer runs and prepares operating documentation. Writes programs for classification, indexing, storage, and retrieval of data and facts, display devices and interfacing with other systems equipment. Should have skills in the management of data information as well as the management of personnel working with data information system.

Qualifications: Graduation from an accredited university with a BS degree in computer science preferred. Should have at least two years experience working as a programmer.

Send resume to Mary Frances Brown, Personnel Director, Sea Island Comprehensive Health Care Corporation, Rt. 3, Box 225, John's Island, South Carolina, 29455.

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PROGRAMMER — Salary range \$11,976 - \$17,700. Up to \$15,000 to start for fully qualified RPG Programmer. We may consider providing training in RPG-2, if highly qualified in other language. College degree in Computer Science, or related field plus 1 year experience as a programmer or any equivalent combination of experience, education, training in programming, operations, computer science or related field. Applications and job information available at (tel: 595-525-3634) County Personnel Office, Room 267, County Courthouse, Las Cruces, New Mexico 88001. Submit resume. Closing date: February 25, 1980. AN EQUAL OPPORTUNITY EMPLOYER.

COMPUTER SCIENCE FACULTY POSITION

Four year, church related, accredited, liberal arts college seeks a faculty member to teach in a growing computer science program beginning September 1, 1980. Preference will be given to candidates with PhD in computer science but will consider persons with a Master's Degree. Experience or education in management and/or business administration a plus. Aurora College has a PDP 11/70 computer with RSTS/E operating system. Send vitae to H.E. Esley, Director of Computer Science Program, Aurora College, Aurora, IL 60007. An equal opportunity/affirmative action employer.

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We are seeking a Sr. Systems Review Analyst, with a corporate title of Assistant Vice President to conduct quality assurance reviews of software applications as they progress through the various development stages.

The selected candidate will possess a minimum of 8 years experience in applications software development and support for a branch banking institution. A minimum of 3 years of the above experience in a project management capacity is also desired. Familiarity with MVS/OS, life cycle development methodologies, structured programming and analysis, on-line systems, database concepts and mini-based or distributed systems. Excellent communications skills, both written and verbal and the ability to interact with all levels of personnel required. Salary to mid \$30's.

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Selected candidates will serve as staff assistants to the managers of development projects. A minimum of 5 years data processing experience and knowledge of IBM Check Processing Control System using 3890 MICR reader/sorters. Positions offer excellent opportunities to advance into management as well as the challenges of solving complex check processing problems. Starting salary in the low to mid \$30's.

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We are seeking qualified individuals for new development projects in Item Processing, 4 years of programming experience with a working knowledge of IBM's Check Processing Control Systems (CPCS). Applicants must have a strong programming background in BAL and COBOL. This is a unique opportunity for advancement into management. Environment includes Dual 3033's under MVS, TSO/SPF, VSAM and IMS.

Individuals interested in joining a company with modern facilities and a highly advanced D.P. environment, should send their resumes to:

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Please send resume including salary history to Ms. Mary Zeek, Director, Personnel, Bio/dynamics Inc., Box 43 Mettlers Road, East Millstone, New Jersey 08873. M/F/EOE

INSTRUCTOR OF DATA PROCESSING

JOB DESCRIPTION:

Instruct lecture and laboratory courses in Data Processing such as Automated Accounting, Introduction to Data Processing, Operations, Data Entry and programming languages. Perform other duties and responsibilities in relation to program development, committee assignments, student club sponsor, etc.

QUALIFICATIONS:

Bachelor's degree in Computer Science or related field and a minimum of two years work experience in data processing required. Preference will be given to applicants with a knowledge of accounting principles and a master's degree in Computer Science and one year of related work experience.

Teaching experience at the post-secondary level is preferred, and some experience in developing and/or utilizing performance based objectives and self-paced instructional modules is desirable.

Must be able to relate to students and co-workers in a positive manner. Participation in faculty evaluation and development is essential.

SALARY:

Per Faculty Salary Schedule

STARTING DATE:

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Robert Ontjes
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Clarkson College of Technology has an opening for a Systems Programmer having 2-3 years experience with a major IBM system. Responsibilities will include generation, support, and enhancement of VM/370 and OS/VS1 on an IBM 4341, which will be installed in June, 1980. Experience with telecommunications processing is desirable.

The position offers an excellent benefit package and a competitive salary. Our employees are encouraged to enter Bachelors, Masters and Doctoral degree programs. Please send resume and salary requirements to:

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Our technical environment consists of an IBM S370/3033; MVS; IMS DB/DC 1.1.5; Data Dictionary 3.0; CICS 1.4; TSO/SPF; SNA-SDIC; and multiple IBM 8100's.

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If you are interested in joining an aggressive implementation and support team, send your resume and salary history or call (513) 335-7171, Ext. 2212.

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Manage a group of approximately 50 analysts and programmers involved in the definition, design, development and implementation of data processing systems in a modern, progressive, high technology manufacturing company.

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Portland, Oregon

Expansion has created immediate needs within Evans Products Company, headquartered in Portland, Oregon. This Fortune 500 company, with 1979 revenues of \$1.5 billion provides outstanding career opportunities to interested MIS professionals.

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If you qualify and are interested in learning more about these positions located in the beautiful Pacific Northwest, please call me collect to discuss compensation and benefits or direct a resume to my attention: Chris Utter, Corporate Personnel Manager, Evans Products Company, 1121 Southwest Salmon, Portland, OR 97205.

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DeKalb General Hospital, located in suburban Atlanta, Georgia (Decatur), has an opening for a Systems Programmer. Applicants should have a minimum of 3 years experience in programming, know several languages (including FORTRAN and COBOL), and have experience with Prime computers. WE OFFER: Excellent benefits and salary-Educational Assistance-Recession proof industry. (Salary \$16M-19M D.O.E.). If you qualify, send your resume or call Roy Thomas, DeKalb General Hospital, 2701 N. Decatur Rd., Decatur, Georgia 30033, (404)-292-4444 Ext. 5000. EOE.

PROGRAMMING

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We are currently recruiting for a number of programming and/or programmer-analyst positions with this leader in the air travel industry. Positions require experience in either AHS COBOL or BAL programming languages. A background in 370/OS Systems would be desirable but not necessary. The company offers an extensive training program in CICS programming methods. The hardware they are currently utilizing consists of two 370/168's running under MVS and utilizing CICS, PARIS, and ACP-8. The wide range of company paid benefits include FREE AIRLINE TRAVEL to anywhere in the world for yourself and members of your family. They also offer a dental plan, profit sharing cost of living index and a 4 day work week. Contact Neil Long 201-368-0222 or submit resume in confidence to:

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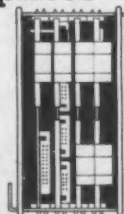
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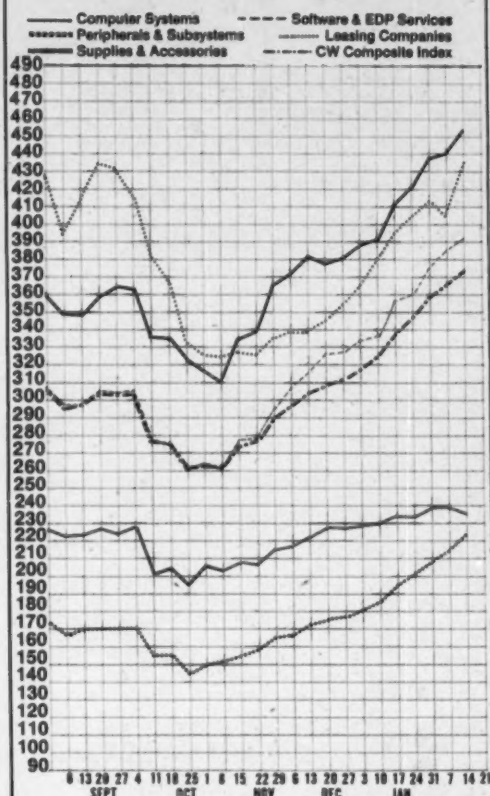
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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 13, 1968

All statistics compiled,
computed and formatted
by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

PRICE						PRICE						PRICE									
F C H	1979-80 NAME (1)	CLOSE FEB 13 1980	WEEK NET CHANGE	WEEK PCT CHANGE	F C H	1979-80 NAME (1)	CLOSE FEB 13 1980	WEEK NET CHANGE	WEEK PCT CHANGE	F C H	1979-80 NAME (1)	CLOSE FEB 13 1980	WEEK NET CHANGE	WEEK PCT CHANGE							
COMPUTER SYSTEMS																					
A	AMDAHL CORP	17- 69	30 1/8	- 1/8	-0.4	O	ADVANCED COF TECH	1- 2	1	0.0	A	DATA ACCESS SYSTEMS	8- 12	11 5/8	+1 7/8	+19.2					
N	BURROUGHS CORP	9- 87	77 3/4	+ 1/2	-0.4	O	ANACOMP INC	4- 24	23	- 1/4	A	DATA PRODUCTS CORP	13- 25	22 3/8	- 1/8	-0.5					
N	COMPUTER AUTOMATION	9- 44	20 1/4	+1	+5.1	O	ANALYSTS INTL CORP	3- 6	5 3/4	0	0.0	A	DATUM INC	2- 6	2 1/2	- 1/2	-16.6				
N	CONTROL DATA CORP	23- 61	61	+ 1/8	+0.2	A	APPLIED DATA RES.	9- 17	12 5/8	+ 5/8	+5.2	O	DECISION DATA COMPUT	2- 6	2 3/4	- 1/4	-8.0				
N	CRAY RESEARCH INC	8- 58	57 1/2	+ 1/2	+0.4	N	AUTOMATIC DATA PROC	24- 40	38 1/4	- 5/8	-1.8	N	DELTA DATA SYSTEMS	3- 9	9 5/8	- 1/4	-4.2				
N	DATA GENERAL CORP	2- 74	65 5/8	+3 3/4	+6.1	N	COMBI-KEY NETWORK	9- 19	19 1/4	- 1/2	-2.6	N	EVANS & SOUTHWELL	20- 50	50	- 1/2	-3.0				
N	DATAPoint INC	34-119	118 1/4	+7 1/8	+6.4	O	COMPUTER HORIZONS	1- 9	4	- 1/2	-11.1	O	FARBIT-GENERAL	1- 2	2 1/4	+ 7/8	+63.6				
N	DIGITAL EQUIPMENT	3- 79	78 5/8	+4 7/8	+6.6	O	COMPUTER NETWORK	9- 16	7 1/4	- 3/4	-9.3	O	GENERAL COMPUTER SYS	1- 3	2 1/4	+ 1/8	+5.0				
N	ELECTRONIC ASSOC.	2- 13	10 1/4	- 1/4	-2.3	O	COMPUTER SCIENCES	8- 24	22 1/2	- 1/2	-2.1	N	GENERAL DATA COMM IND	10- 20	19 1/2	- 1/4	-0.9				
A	ELECTRONIC ENGINEER	9- 19	15 1/2	- 1/2	-0.9	O	COMPUTER TASK GROUP	4- 5	4 1/2	- 1/2	-12.5	N	HARLETTINE CORP	10- 29	25 1/2	- 1/4	-0.9				
N	FOUR-PHASE SYSTEMS	10- 47	37 7/8	+4 7/8	+14.7	O	COMPUTER USAGE	4- 5	3/4	+ 1/4	+5.5	N	MAZZES CORP	17- 39	38 1/8	- 1/8	-0.4				
N	FORXORO	28- 44	41 3/4	+ 3/8	+0.9	O	COMPUT AUTO REP SVC	4- 10	6 1/4	- 5/8	-9.0	O	INFORSEC INC	1- 11	1 5/8	- 3/8	-18.7				
N	GENERAL AUTOMATION	7- 29	17 1/2	- 1/2	-4.7	O	CSH COMP	9- 14	9 1/4	- 1/4	-4.0	O	INFORMATION INTL INC	1- 4	1 1/8	- 1/4	-7.4				
O	GTE COMPUTER CORP	1- 3	5/4	0	0.0	O	CULLINANE COMP	14- 33	33	+3	+10.0	O	INTEC	1- 4	5/8	- 1/4	-7.4				
N	HEWLETT-PACKARD CO	24- 70	69 5/4	+2 3/4	+3.5	O	DATA DIMENSIONS INC	1- 9	1 3/4	- 1/8	-0.6	O	INTEL CORP	20- 74	74	+5	+7.2				
N	HYMTELL INC	43- 92	91 1/4	+1 3/4	+1.9	N	DATAPAR	1- 4	1 1/4	- 1/8	-11.1	O	INTERFIL	7- 32	28 3/4	- 1/4	-0.8				
N	IBM	42-221	68 3/4	+1	+0.8	O	DATA SERVICES	9- 14	9 1/4	- 1/4	-4.0	A	LUNBY ELECTRONICS	4- 11	9 7/8	- 1/4	-2.4				
N	MANAGEMENT ASSIST	9- 20	20 1/4	+3 1/4	+19.1	N	ELECTRONIC DATA SYS.	13- 28	26 1/4	+1 3/8	+5.5	O	MDSI DATA CORP	6- 19	10 5/8	+1 1/4	+12.3				
O	MANUFACTURING DATA S	9- 34	33 1/4	- 1/4	-0.3	O	INSTE CORP	1- 3	1 5/8	0	0.0	N	NEUMER	17- 58	17 1/2	- 3/4	-4.1				
O	MINI-COMPUTER SYST	2- 8	5	- 1/8	-2.4	O	IPS COMPUTER MARKET	2- 3	3 1/4	0	0.0	N	NONAKA DATA SCI	1- 9	10 1/2	- 3/8	-4.1				
O	MODULAR COMPUTER SYS	7- 18	13 5/4	+1 3/8	+11.2	O	KEANE ASSOCIATES	2- 9	8 1/2	+ 3/4	+9.6	O	OMER	4- 8	9	0	0.0				
N	NEC	17- 81	79 3/4	+3 3/4	+4.9	O	KEYDATA CORP	1- 5	5 7/8	0	0.0	O	PARADYNE CORP	9- 33	33	+3 3/4	+12.6				
N	PHILIPPE COMPUTER INC	9- 21	28	0	0.0	A	LORICOM	10- 23	22	0	0.0	O	PERVAL CORP	1- 1	1	- 1/4	-1.8				
N	PERKIN-ELMER	17- 47	45 1/2	+2 1/8	+4.7	O	NATIONAL DATA CORP	7- 10	10	+ 1/4	+1.4	A	POTTER INSTRUMENT	2- 2	2 3/4	0	0.0				
N	SPEERDAY HAND	33- 60	57 1/4	- 3/4	-1.2	N	PLANNING RESEARCH	4- 10	4 1/8	+ 3/8	+4.6	O	RAMTEC CORP	7- 16	16 1/4	0	0.0				
A	SYSTEMS ENGR. LABR	11- 24	19 5/8	-1	-4.8	O	PROGRAMMED TAP SYS	3- 5	5	0	0.0	O	RECOGNITION EQUIP	5- 13	10 1/2	+ 1/4	+1.2				
O	TANDEM COMPUTERS INC	13- 26	25 1/2	- 1/4	-1.5	O	PROGRAMING & SYS	1- 1	1 7/8	0	0.0	O	SCAN DATA INC	10- 20	19 1/2	- 1/4	-0.9				
O	WANG LABS.	4- 40	30 1/2	+3 3/8	+9.9	N	RAPIDATA INC	3- 7	5 1/2	- 1/8	-2.2	N	SHORR DATA TECHNOLOGY	14- 45	45 3/4	- 1/8	-0.9				
						O	REYNOLDS & REYNOLD	18- 39	29 3/4	+2 1/4	+8.1	O	STRESK DATAHOLDS	11- 29	29	+1	+3.5				
						O	SCIENTIFIC COMPUTERS	10- 18	18 3/4	+1/2	+3.8	N	TECH DATA INC	11- 29	28 1/4	- 1/4	-1.1				
						N	TIMEWARE INC	18- 56	55 3/4	+3 1/8	+6.6	A	TEC INC	8- 13	13 1/8	0	0.0				
						A	UHS SYSTEMS	5- 11	11 3/4	+1 1/8	+10.9	N	TELETRONIX INC	33- 64	61 1/4	- 3/4	-1.2				
						N	WTLY CORP	1- 9	8 1/4	- 1/8	-1.5	N	TELER	3- 9	9 5/8	- 1/2	-9.7				
LEASING COMPANIES																					
O	HOOTHE FINANCIAL CP	13- 21	16 1/2	- 1/4	-1.4	PERIPHERALS & SUBSYSTEMS									O	TELETYPE SYSTEMS CP	4- 14	13 7/8	- 1/8	-0.8	
O	COMISCO INC	3- 21	14 1/2	-1	-0.4	N	AM INTERNATIONAL	13- 32	37 3/4	- 5/8	-3.4	O	TIMEPLEX INC	1- 2	3/4	0	0.0				
A	COMMERCE GROUP CORP	1- 1	1 1/4	+ 5/8	+125.0	N	AMPEX CORP	10- 22	20 1/4	- 1/4	-1.2										
O	CONFIDENTIAL INFO SYS	3- 15	3 3/4	0	0.0	O	ANDERSON JACOBSON	5- 16	15 3/4	+1 3/8	+9.5	SUPPLIES & ACCESSORIES									
N	DATONIC RENTAL	1- 4	2 3/4	0	0.0	N	APPLIED DIV DATA SYS	0- 22	4 7/8	- 1/8	-1.4	A	AMERICAN BUS PROPS	0- 12	10 3/4	0	0.0				
A	DEL INC	3- 6	5 1/4	0	0.0	O	AUTO-TROL TECHNOLOGY	14- 39	39 1/2	+1/2	+1.3	O	BALTIMORE BUS FORMS	1- 4	1	0	0.0				
N	DFI	1- 7	1 1/2	- 1/4	-1.4	O	BEPIV INC	7- 34	34	+2 3/4	+8.1	N	HARRY WRIGHT	14- 34	27 1/4	- 1/4	-0.8				
N	ITCL	4- 36	4 1/2	- 1/4	-5.2	A	BOLT-BERANEKA & NEW	0- 22	21 1/2	+1/2	+1.5	N	PHOTOCOPY INC	1- 1	1 3/4	+ 1/4	+3.8				
N	LEASCO CORP	24- 68	68	+7 1/2	+12.3	N	BUNNEN-IRAM	10- 32	29 3/4	- 3/8	-1.2	O	DUPLER PRODUCTS INC	13- 31	31 3/4	+1 5/8	+9.2				
O	LEASPCAP CORP	4- 1	1/8	0	0.0	N	CAMERIDGE REQUEST	1- 7	7	- 1/4	-0.5	N	EMWIS BUS. FORMS	9- 21	19 7/8	- 7/8	-5.2				
N	PIONEER TEA CORP	2- 7	7 3/8	0	0.0	O	COMPUTER DEVICES INC	3- 0	4	- 1/4	-0.5	N	FORM PRODUCTS	20- 34	31 3/4	0	0.0				
N	U.S. LEASING	12- 20	15 1/8	- 1/8	-7.0	N	CENTRONICS DATA CORP	10- 54	37 1/4	- 2	-5.0	N	GAHARU CORP LTD	20- 34	31 3/4	0	0.0				
						O	COGNITRONICS	1- 3	3 1/2	- 1/2	-12.5	O	SHAMARU REGISTER	20- 29	27	-1	-3.5				
						O	COMPUTER CUMULUM	0- 10	3 1/4	+ 1/8	+2.2	N	IBM PRODUCTS	20- 20	20	0	0.0				
						A	COMPUTER CONSOLES	4- 23	23 1/4	0	0.0	N	WARRAH MAGNETICS	14- 22	17 7/8	- 1/4	-1.1				
						A	COMPUTER EQUIPMENT	3- 7	6 1/2	0	0.0	N	WALLACE BUS FORMS	18- 33	29 1/4	- 3/8	-1.2				
						O	COMPUTER TRANSCIVER	1- 5	1 1/4	- 1/4	-12.5										
						O	COMPUTER-TELEVISION CORP	0- 58	57 3/4	+5 3/4	+10.3										
						N	CONACOR CORP	13- 26	24 1/4	- 1/4	-10.2										
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March 20 DETROIT
March 25 PHILADELPHIA
March 31 DENVER
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April 9 JACKSONVILLE
April 10 NEWARK
April 15 ATLANTA
April 17 COLUMBUS
April 22 STAMFORD
April 25 DALLAS
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May 6 WASHINGTON, D.C.
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